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TITLE: FLAME-RETARDANT, VINYL
CHLORIDE-BASED RESIN MOLDED
PRODUCT

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ABSTRACT:

PROBLEM TO BE SOLVED: To provide a flame-retardant, vinyl chloride-based resin molded product excellent in flame retardancy, generating a small amount of smoke and gases, good in chemical resistance and corrosion resistance.

SOLUTION: The flame-retardant, vinyl chloride-based resin molded product comprises a vinyl chloride-based resin and, incorporated

thereinto, at least one of blowing agents, decomposition accelerators, radical initiators and crosslinking agents, as a flame retardancy-imparting component in a specific ratio, or a combination of a titanium compound and the flame-retardancy-imparting component. In the case of a transparent molded product, the flame retardancy-imparting agent, a phosphor-containing flame-retardant or a zinc compound, or a combination thereof is incorporated.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to the vinyl chloride system resin Plastic solid which has the outstanding fire retardancy.

[0002]

[Description of the Prior Art] A moldability is good, the mechanical strength of vinyl chloride resin is high, and it is cheap, since chemical resistance is also good, begins semiconductor fabrication machines and equipment as industrial use material, especially an anti-corrosion industrial use material, and is widely used for all fields.

[0003] In order to pyrolyze if a fire breaks out and to take out smoke and a corrosive gas so much, although it has a certain amount of fire retardancy, since this vinyl chloride resin contains chlorine, when the Plastic solid of this vinyl chloride resin was used for semiconductor fabrication machines and equipment etc., the air in a manufacture institution became dirty by the smoke and the corrosive gas which occur in case of a fire, and there was a possibility that manufacturing installations, an equipment, semiconductor parts, etc. might be polluted, or it might be invaded. The Plastic solid of vinyl chloride resin which has still higher fire retardancy from such a situation comes to be required, and research of the vinyl-chloride-resin Plastic solid which satisfies this demand is done.

[0004] Although a lot of inorganic fillers were made to contain from the former or the means of making the flame retarder of a halogen system contain etc. was mainly adopted in order to have raised the fire retardancy of a vinyl-chloride-resin Plastic solid, when such a means was adopted, there was a problem which is described below.

[0005]

[Problem(s) to be Solved by the Invention] That is, when making an inorganic filler contain so much, it could not become difficult to obtain the Plastic solid in which a vinyl-chloride-resin Plastic solid carries out an embrittlement, and has a practical strength, and a transparent Plastic solid could not be obtained upwards, either, and there was a problem that the chemical resistance and the corrosion resistance of a Plastic solid fell.

[0006] On the other hand, although the fire retardancy of a Plastic solid could be raised, when there is a problem of generating the corrosive gas containing the halogen so much, in case of a fire and the transparent Plastic solid was made to contain a halogen system flame retarder when making the flame retarder of a halogen system contain, there was a problem that transparency fell sharply.

[0007] this invention aims at offer of the outstanding fire-resistant vinyl chloride system resin Plastic solid which can solve these problems.

[0008]

[Means for Solving the Problem] In order to attain the aforementioned purpose, the fire-resistant vinyl chloride system resin Plastic solid concerning the claim 1 of this invention is characterized by the thing of a foaming agent, a decomposition accelerator, a radical generating agent, and a cross linking agent done for the 0.0005-10 weight section content of any one sort at least to the vinyl chloride system resin 100 weight section.

[0009] The reason whose fire retardancy will improve if a vinyl chloride system resin is made to contain the above-mentioned foaming agent, a decomposition accelerator, a radical generating agent, and a cross linking agent is considered as follows.

[0010] If too much heat joins a vinyl chloride system resin Plastic solid from the outside, while the chlorine in a vinyl chloride system resin will break away with heat and will generally demonstrate a fire-resistant operation, the resin from which chlorine seceded pyrolyzes and it results in combustion. In process in which it results in this combustion, if the foaming agent contains in the Plastic solid If the operation whose foaming agent of this foams by the pyrolysis and intercepts the heat from the outside is carried out and the decomposition accelerator contains If the operation whose decomposition accelerator of this promotes disassembly of a vinyl chloride system resin, and brings carbonization forward is carried out and the radical generating agent contains If the operation whose radical to generate promotes disassembly of a vinyl chloride system resin, and brings carbonization forward is carried out and the cross linking agent contains In order to carry out the operation which suppresses gasification when this cross linking agent reacts with the polymer molecule of a vinyl chloride system resin and carries out macromolecule quantification, it is thought that the fire retardancy of a vinyl chloride system resin Plastic solid improves.

[0011] Next, the fire-resistant vinyl chloride system resin Plastic solid concerning the claim 2 of this invention is characterized for a foaming agent by the thing of 0.0005 - 10 weight section, a decomposition accelerator, a radical generating

agent, and a cross linking agent done for the 0.0005-10 weight section content of any one sort at least to the vinyl chloride system resin 100 weight section.

[0012] The foaming agent is more effective than other decomposition accelerators, a radical generating agent, and a cross linking agent, when suppressing early combustion, in order to intercept the heat from the outside by foaming in the stage in early stages of process in which it results in combustion. Therefore, while, as for the thing which used the foaming agent as the indispensable component like this vinyl chloride system resin Plastic solid, and was made to contain combining this foaming agent, other decomposition accelerators, a radical generating agent, or a cross linking agent, early combustion is enough suppressed by heat interception operation of a foaming agent, the outstanding fire retardancy is demonstrated after that according to the synergism of a heat interception operation of a foaming agent and the operation which the decomposition accelerator, the radical generating agent, or the cross linking agent mentioned above.

[0013] Next, the fire-resistant vinyl chloride system resin Plastic solid concerning the claim 3 of this invention It is the Plastic solid which carried out the laminating unification of the surface layer at least at one side of a substratum. a substratum It is the layer of a decomposition accelerator, a radical generating agent, and a cross linking agent which carries out 0.0005-10 weight section content of any one sort at least to the vinyl chloride system resin 100 weight section. a surface layer To the vinyl chloride system resin 100 weight section, 0-10 weight section content of the foaming agent is carried out, or it is characterized by being the layer of 0 - 10 weight section, a decomposition accelerator, a radical generating agent, and a cross linking agent which carries out 0.0005-10 weight section content of any one sort at least about a foaming agent.

[0014] While the combustion depressor effect which the first stage excelled [Plastic solid / such] in the surface layer by heat interception operation of the foaming agent contained in a surface layer in the early stage result in combustion since a foaming agent is independent or it contains combining other decomposition accelerators etc. is demonstrated, the outstanding fire retardancy is demonstrated after that according to the synergism of a heat interception operation of a foaming agent and the operation which the decomposition accelerator contained in a surface layer or a substratum, the radical generating agent, or the cross linking agent mentioned above. Moreover, since the foam produced in disassembly of the foaming agent of a surface layer catches the corrosive gas which occurs in a substratum, the amount's of gas evolutions decreases.

[0015] Next, the fire-resistant vinyl chloride system resin Plastic solid concerning the claim 4 of this invention It is the Plastic solid which carried out the laminating unification of the surface layer at least at one side of a substratum. a substratum The degree of chlorination receives less than 58% of vinyl chloride system resin 100 weight section. A foaming agent, It is the layer of a decomposition accelerator, a radical generating agent, and a cross linking agent which carries out 0.0005-10 weight section content of any one sort at least, and a surface layer is characterized by the degree of chlorination being the layer of 58% or more of vinyl chloride system resin.

[0016] The degree of chlorination of a vinyl chloride system resin and fire retardancy have a positive correlation, and fire retardancy improves, so that the degree of chlorination becomes high. Therefore, like this Plastic solid, if the degree of chlorination forms a surface layer by 58% or more and the high vinyl chloride system resin, even if it does not make fire-resistant grant components, such as a foaming agent, completely contain, the fire retardancy of a surface layer will improve. Therefore, this Plastic solid demonstrates the fire retardancy in which the substratum was excellent as a whole conjointly with fire retardancy being raised by content of a foaming agent, a decomposition accelerator, a radical generating agent, or a cross linking agent.

[0017] Since all fire-resistant vinyl chloride system resin Plastic solids concerning the above claims 1-4 contain an inorganic filler, chemical resistance and corrosion resistance are good, and do not produce an on-the-strength fall by the embrittlement.

[0018] In addition, since it becomes difficult to give sufficient fire retardancy for a Plastic solid when the content of a foaming agent, a decomposition accelerator, a radical generating agent, and a cross linking agent is less than the range indicated by claims 1-4 in the Plastic solid of claims 1-4, and the further improvement in the fire retardancy corresponding to it is not found even if it makes it contain so that it may exceed the range indicated by claims 1-4 on the other hand, it becomes a waste of material.

[0019] Next, the fire-resistant vinyl chloride system resin Plastic solid concerning the claim 5 of this invention is characterized for a titanium compound by the thing of 5 - 50 weight section, a foaming agent, a decomposition accelerator, a radical generating agent, and a cross linking agent done for the 0.0005-10 weight section content of any one sort at least to the vinyl chloride system resin 100 weight section, and titanium oxide, a potassium titanate, etc. which are indicated by the claim 9 are used as a titanium compound.

[0020] Since titanium compounds, such as titanium oxide, have very high pyrolysis temperature and the whiteness degree and thermal conductivity are high powder, In process in which it will result in combustion if such a titanium compound contains to the vinyl chloride system resin While carrying out the work (heat interception operation) which intercepts the heat from the outside by the high whiteness degree, without this titanium compound decomposing to the elevated temperature of 1200-1300 degrees C In pyrolysis of the resin after chlorine secession, and the stage of combustion, the work (carbonization promotion operation) which carbonizes this resin more quickly with high thermal conductivity is carried out. And when the foaming agent contains with this titanium compound When the fire retardancy which the heat interception operation which this foaming agent mentioned above joined the heat interception operation of a titanium compound, and was further excellent is demonstrated and the decomposition accelerator and the radical generating agent contain When the fire retardancy which the carbonization promotion operation which this decomposition accelerator and this radical generating agent mentioned above joined the carbonization promotion operation of a titanium compound, and was further excellent is demonstrated and the cross linking agent contains further The fire retardancy which the gasification depressant action, the heat interception operation of a

titanium compound, and carbonization promotion operation which this cross linking agent mentioned above multiplied, and was further excellent is demonstrated.

[0021] In the Plastic solid of this claim 5, if the content of a titanium compound exceeds 50 weight sections and the content of a foaming agent, a decomposition accelerator, a radical generating agent, and a cross linking agent exceeds 10 weight sections, although fire retardancy will improve notably, the chemical resistance of a Plastic solid, intensity, bending nature, etc. fall. On the other hand, if the content of a titanium compound is less than 5 weight sections and the content of a foaming agent, a decomposition accelerator, a radical generating agent, and a cross linking agent is less than the 0.0005 weight section, a heat interception operation and carbonization promotion acting will become inadequate, and it will become difficult to raise fire retardancy.

[0022] Next, the fire-resistant vinyl chloride system resin Plastic solid concerning the claim 6 of this invention is further characterized by the thing of a chlorine capture compound and a minerals assistant done for the 2-30 weight section content of any one sort at least in the Plastic solid of the above-mentioned claim 1, a claim 2, or a claim 5.

[0023] Since chlorine is captured with a chlorine capture compound at the time of combustion when a chlorine capture compound is included, when the yield of corrosive gases, such as chlorine gas and hydrogen chloride gas, decreases further and a minerals assistant is included, in order that a titanium compound and a minerals assistant may multiply this Plastic solid and it may promote carbonization of a vinyl chloride system resin further, the amount of emitting smoke decreases further and its fire retardancy improves further.

[0024] When there are few contents of a chlorine capture compound or a minerals assistant than 2 weight sections, the yield of a corrosive gas or smoke seldom decreases, but the further fire-resistant improvement also becomes difficult. On the other hand, when a content exceeds 30 weight sections, the chemical resistance of a Plastic solid, intensity, bending nature, a moldability, etc. fall.

[0025] Next, the fire-resistant vinyl chloride system resin Plastic solid concerning the claim 7 of this invention It is the Plastic solid which carried out the laminating unification of the surface layer at least at one side of a substratum. a substratum To the vinyl chloride system resin 100 weight section, it is the layer which carries out 5-50 weight section content of the titanium compound, and a surface layer is characterized by being the layer which carries out 0.0005-10 weight section content of 0 - 30 weight section and the foaming agent for a titanium compound to the vinyl chloride system resin 100 weight section.

[0026] Below 30 weight sections, since there are few contents of the titanium compound of a surface layer, this Plastic solid The front face of a Plastic solid has the good chemical resistance and the good corrosion resistance of vinyl chloride system resin original. And since 5-50 weight section content of the titanium compound which demonstrates a heat interception operation and a carbonization promotion operation to the substratum of this Plastic solid is carried out and 0.0005-10 weight section content of the foaming agent which demonstrates a heat interception operation to a surface layer is carried out, this Plastic solid has the fire retardancy which was excellent as a whole. And since the corrosive gas which the foam produced in disassembly of the foaming agent of a surface layer generates in a substratum is caught, the amount of gas evolutions also decreases.

[0027] Next, the fire-resistant vinyl chloride system resin Plastic solid concerning the claim 8 of this invention It is the Plastic solid which carried out the laminating unification of the surface layer at least at one side of a substratum. a substratum As opposed to the vinyl chloride system resin 100 weight section a titanium compound 5 - 50 weight section, It is the layer of a decomposition accelerator, a radical generating agent, and a cross linking agent which carries out 0.0005-10 weight section content of any one sort at least. a surface layer It is characterized by being the layer which carries out 0.0005-10 weight section content of 0 - 30 weight section and the foaming agent for a titanium compound to the vinyl chloride system resin 100 weight section.

[0028] Since this Plastic solid also has few contents of the titanium compound of a surface layer as [below] 30 weight sections, the front face of a Plastic solid has the good chemical resistance and the good corrosion resistance of vinyl chloride system resin original. And with the titanium compound which demonstrates a heat interception operation and a carbonization promotion operation, since the decomposition accelerator and radical generating agent which demonstrate a carbonization promotion operation, and the cross linking agent contain the substratum, it is excellent in fire retardancy, catches the corrosive gas which occurs in this substratum by the foam produced by disassembly of the foaming agent of a surface layer, and suppresses the amount of gas evolutions. Therefore, this Plastic solid has the fire retardancy which was excellent as a whole.

[0029] Next, the fire-resistant vinyl chloride system resin Plastic solid concerning the claim 10 of this invention is characterized by carrying out 5-50 weight section content of the potassium titanate to the vinyl chloride system resin 100 weight section.

[0030] In order that a potassium titanate may demonstrate a heat interception operation and a carbonization promotion operation also for carrying out 5-50 weight section content of the potassium titanate which is a titanium compound like this Plastic solid in case of a fire, fire retardancy improves and the yield of smoke or a corrosive gas decreases.

[0031] Next, the transparent fire-resistant vinyl chloride system resin Plastic solid concerning the claim 11 of this invention is characterized by for all the light transmissions that carried out 0.5 - 15 weight section for the Lynn system flame retarder, and carry out 0.5-7 weight section content of 0.5 - 20 weight section and the tin system stabilizer for a chlorinated polyethylene being 50% or more, and the Hayes value being 60% or less of Plastic solid to the vinyl chloride system resin 100 weight section whose degrees of chlorination are abbreviation 58 - 73% of abbreviation.

[0032] According to this fire-resistant vinyl chloride system resin Plastic solid, the operation which the Lynn system flame retarder oxidizes or pyrolyzes at the time of combustion, and generates a phosphoric acid, promotes surface carbonization

while this phosphoric acid remains on the front face of a vinyl chloride system resin and bars oxygen transfer, and suppresses combustion is demonstrated. And the operation which generates chlorine gas by the pyrolysis and delays combustion is carried out, a vinyl chloride system resin with the high degree of chlorination also generates a lot of chlorine gas by the pyrolysis, and a chlorinated polyethylene delays combustion. Therefore, this vinyl chloride system resin Plastic solid is excellent in fire retardancy, and has few amounts of emitting smoke.

[0033] Moreover, if the Lynn system flame retarder is made to contain like this vinyl chloride system resin Plastic solid, transparency will improve compared with the case where a halogen system flame retarder is made to contain, and the Plastic solid which has 50% or more of all light transmissions and 60% or less of Hayes value as mentioned above will be obtained. In order that a tin system stabilizer may obtain a transparent vinyl chloride system resin Plastic solid, it is an indispensable thermostabilizer, and even if it adds a lead system stabilizer, it is difficult to obtain a transparent Plastic solid. In addition, all above-mentioned light transmissions and the above-mentioned Hayes value are a value in case the thickness of a Plastic solid is 5mm.

[0034] If the content of the Lynn system flame retarder and a chlorinated polyethylene becomes less than the 0.5 weight section to the vinyl chloride system resin 100 weight section, respectively, it will become difficult to give sufficient fire retardancy for a Plastic solid. On the other hand, if the content of the Lynn system flame retarder increases more than 15 weight sections, this flame retarder will come to carry out a bleed out, and if the content of a chlorinated polyethylene increases more than 20 weight sections, transparency will fall. Furthermore, it becomes disadvantageous, when raising fire retardancy, if the degree of chlorination uses a low vinyl chloride system resin from 58%, and since the vinyl chloride system resin with the degree of chlorination higher than 73% has thermal stability, a moldability, chemical resistance, bad corrosion resistance, etc., it is unsuitable.

[0035] Next, the transparent fire-resistant vinyl chloride system resin Plastic solid concerning the claim 12 of this invention is characterized by for all the light transmissions that the zinc compound was converted [light transmissions] into the amount of metal zinc, and carry out 0.5-7 weight section content of 0.005 - 5 weight section and the tin system stabilizer being 40% or more, and the Hayes value being 60% or less of Plastic solid to the transparent vinyl chloride system resin 100 weight section.

[0036] If a zinc compound is made to contain like this Plastic solid, since carbonization of vinyl chloride resin will be promoted by pitch solution promotion operation of a zinc compound at the time of combustion, fire retardancy improves. It will be bad opaque, if it becomes difficult to give sufficient fire retardancy for a Plastic solid if the content of a zinc compound converts into the amount of metal zinc and becomes less than the 0.005 weight section and it increases more than 5 weight sections on the other hand. In addition, all above-mentioned light transmissions and the above-mentioned Hayes value are a value in case the thickness of a Plastic solid is 5mm.

[0037] Next, the transparent fire-resistant vinyl chloride system resin Plastic solid concerning the claim 13 of this invention is characterized by the degree of chlorination of a vinyl chloride system resin being 56% of abbreviation in the Plastic solid of the above-mentioned claim 12.

[0038] If the vinyl chloride system resin whose degree of chlorination is 56% of abbreviation is used like this Plastic solid, chemical resistance is good and can consider as the Plastic solid which has fire retardancy.

[0039] Next, the fire-resistant vinyl chloride system resin Plastic solid concerning the claim 14 of this invention is further characterized by the thing of a foaming agent, a decomposition accelerator, a radical generating agent, and a cross linking agent done for the 0.0005-10 weight section content of any one sort at least in the Plastic solid of either the above-mentioned claim 11 or the claim 13.

[0040] Fire retardancy is further raised by the heat interception operation whose foaming agent mentioned such a Plastic solid above, the carbonization promotion operation which the decomposition accelerator and the radical generating agent mentioned above, and the gasification depressant action which the cross linking agent mentioned above. If these contents become less than the 0.0005 weight section, it becomes difficult to raise fire retardancy further, and since the fire-resistant disposition top effect of having balanced it is not acquired even if it makes a large quantity contain from 10 weight sections, on the other hand, it will become useless.

[0041] Next, the fire-resistant vinyl chloride system resin Plastic solid concerning the claim 15 of this invention As opposed to the vinyl chloride system resin 100 weight section whose degrees of chlorination are abbreviation 58 - 73% of abbreviation 0.5 - 15 weight section and a tin system stabilizer for the Lynn system flame retarder or a chlorinated polyethylene 0.5 - 7 weight section, It is characterized by for all the light transmissions of a foaming agent, a decomposition accelerator, a radical generating agent, and a cross linking agent that carry out 0.0005-10 weight section content of any one sort at least being 40% or more, and the Hayes value being 60% or less of Plastic solid.

[0042] Since the fire retardancy of a Plastic solid is raised by the fire-resistant grant component when blending fire-resistant grant components, such as a foaming agent, like this Plastic solid, it becomes unnecessary to make the both sides of the Lynn system flame retarder and a chlorinated polyethylene contain like the Plastic solid of the aforementioned claim 11, one of the Lynn system flame retarder and the chlorinated polyethylenes is made to only contain, and it becomes possible to give the outstanding fire retardancy. In addition, an operation of the Lynn system flame retarder blended with this Plastic solid, a chlorinated polyethylene, a tin system stabilizer, etc. is as by the way the Plastic solid of the aforementioned claim 11 having explained.

[0043]

[Embodiments of the Invention] Hereafter, the concrete operation gestalt of this invention is explained in full detail.

[0044] The fire-resistant vinyl chloride system resin Plastic solid of this invention ** foaming agent, a decomposition accelerator, A radical generating agent or a cross linking agent (these are hereafter called fire-resistant grant component collectively) is included. Plastic solid B containing either and the titanium compound of Plastic solid A which contains neither a titanium compound nor the Lynn system flame retarder nor a zinc compound, and ** fire retardancy grant component ** It is divided roughly into transparent Plastic solid D which contains either of the fire-resistant grant components as preferably as Plastic solid C, ** Lynn system flame retarder, zinc compound, or chlorinated polyethylene which does not contain a fire-resistant grant component including a titanium compound.

[0045] As main operation gestalten of Plastic solid A, they are Plastic solid A1 of the monolayer structure described below, A2 and A3, A4, and A5. Plastic solid A6 of a double layer structure, and A7 It is mentioned.

[0046] Plastic solid A1 the Plastic solid of monolayer structure which carries out 0.0005-10 weight section content of the foaming agent among fire-resistant grant components to the vinyl chloride system resin 100 weight section -- it is -- this Plastic solid A1 **** -- optimum dose combination of the various additives, such as a stabilizer of a lead system or a tin system required for fabrication, lubricant, processing aid, and a coloring agent, is carried out The stabilizer of a lead system is used when obtaining an opaque Plastic solid, and the stabilizer of a tin system is used when obtaining a transparent Plastic solid.

[0047] the general vinyl chloride resin whose degree of (a) chlorination is about 56% as a vinyl chloride system resin, the back chlorinated polyvinyl chloride resin whose degrees of (b) chlorination are abbreviation 58 - 73% of abbreviation, and (c) -- a copolymerization resin with the resin which mixed these vinyl chloride resin, the resin which mixed a vinyl acetate resin, acrylic resin, etc. and (d) (e) vinyl chloride, vinyl acetate, ethylene, etc. is used for these vinyl chloride resin

[0048] The general vinyl chloride resin of (a) is Plastic solid A1 which was excellent chemical-resistant. Especially when obtaining, are effective. The back chlorinated polyvinyl chloride resin of (b) is Plastic solid A1 excellent in fire retardancy. Especially when obtaining, are effective. The mixed resin of (c) is Plastic solid A1 with chemical-resistant and fire-resistant sufficient balance. It is Plastic solid A1 to which it is effective in especially when obtaining, and the mixed resin of (d) and the copolymerization resin of (e) have improved physical properties, such as a moldability and bending nature. It is effective especially when obtaining. It is necessary to make it the resin of (c), (d), and (e) maintain fire retardancy by mixing or carrying out copolymerization of the degree of average chlorination so that it may become about 50 - 73% of abbreviation.

[0049] As a foaming agent contained to this vinyl chloride system resin, what starts foaming is suitable at the temperature of 200 degrees C or more higher than the fabricating-operation temperature of a vinyl chloride system resin, for example, an AZOJI carvone amide, an azobisisobutyronitril, a dinitrosopentamethylenetetramine, a hydrazide compound, the mixture of inorganic carbonates (for example, PARATORU en sulfonylhydrazide, 4, and 4'-oxybis benzene sulfonylhydrazide etc.) and an organic acid, etc. are used preferably.

[0050] Plastic solid A1 of monolayer structure which made the vinyl chloride system resin contain such a foaming agent If it does not foam at the time of fabrication and bending and is heated more than foaming temperature in case of a fire, in order to demonstrate the heat interception operation which the foaming agent foamed and was excellent, it is Plastic solid A1. Fire retardancy improves sharply. And since smoke and a corrosive gas are incorporated in a foam, the amount of emitting smoke and a corrosive-gas yield can also be decreased.

[0051] Since the fire retardancy disposition top effect which balanced it even if it becomes difficult to give sufficient fire retardancy for a Plastic solid since it is required for the content of a foaming agent to consider as 0.0005 - 10 weight section to the vinyl chloride system resin 100 weight section and heat interception operations run short under in the 0.0005 weight sections and it made the large quantity contain from 10 weight sections on the other hand is not seen, it becomes a waste of a foaming agent. The still more desirable content of a foaming agent is 0.05 - 5 weight section.

[0052] This Plastic solid A1 In addition to having the fire retardancy which was excellent as mentioned above, since an inorganic filler is not included, chemical resistance and corrosion resistance are good, and intensity does not fall by the embrittlement.

[0053] Next, Plastic solid A2 To the vinyl chloride system resin 100 weight section, it is the Plastic solid of monolayer structure which carries out 0.0005-10 weight section content of the decomposition accelerator among fire-resistant grant components, and is this Plastic solid A2. Optimum dose combination of the various additives, such as a stabilizer of a lead system or a tin system required for fabrication, lubricant, processing aid, and a coloring agent, is carried out.

[0054] As a decomposition accelerator, what promotes disassembly of a vinyl chloride system resin is suitable at the temperature of 200 degrees C or more higher than the fabricating-operation temperature of a vinyl chloride system resin, and a zinc compound (for example, zinc soap, such as lauric-acid zinc, a zinc stearate, and benzoic-acid zinc), amine compounds (for example, a melamine, a triethylamine, etc.), an iron hydroxide, etc. are preferably used also in it. In addition, a vinyl chloride system resin is above-mentioned Plastic solid A1. The same thing as what was used is used.

[0055] Plastic solid A2 which made the vinyl chloride system resin contain such a decomposition accelerator Although a vinyl chloride system resin is not decomposed by the decomposition accelerator at the time of fabrication and bending, since disassembly of a vinyl chloride system resin is promoted with a decomposition accelerator and carbonization is brought forward, the outstanding fire retardancy can be demonstrated in process in which it results in the combustion in case of a fire.

[0056] Since the fire-retardancy disposition top effect which balanced it even if it becomes difficult to give sufficient fire retardancy for a Plastic solid since it is required for the content of a decomposition accelerator to consider as 0.0005 - 10 weight section to the vinyl chloride system resin 100 weight section and carbonization promotion operations run short under in the 0.0005 weight sections and it made the large quantity contain from 10 weight sections on the other hand is not seen, it

becomes a waste of a decomposition accelerator. The still more desirable content of a decomposition accelerator is 0.05 - 5 weight section.

[0057] Next, Plastic solid A3 To the vinyl chloride system resin 100 weight section, it is the Plastic solid of monolayer structure which carries out 0.0005-10 weight section content of the radical generating agent among fire-resistant grant components, and is this Plastic solid A3. Optimum dose combination of the various additives, such as a stabilizer of a lead system or a tin system required for fabrication, lubricant, processing aid, and a coloring agent, is carried out.

[0058] As a radical generating agent, what generates a radical is suitable at the temperature of 200 degrees C or more higher than the fabricating-operation temperature of a vinyl chloride system resin, for example, peroxides, such as JIAMI looper oxide, peroxi dicarbonate, dialkyl peroxide, and hydroperoxide, a perchlorate, etc. are used preferably. In addition, a vinyl chloride system resin is above-mentioned Plastic solid A1. The same thing as what was used is used.

[0059] Plastic solid A3 which made the vinyl chloride system resin contain the radical generating agent which acts at an elevated temperature as mentioned above Although there is no fear of degradation since a radical does not occur at the time of fabrication and processing, since the radical generated by the radical generating agent promotes disassembly of a vinyl chloride system resin and brings carbonization forward, the outstanding fire retardancy can be demonstrated in process in which it results in the combustion in case of a fire.

[0060] Since the fire-retardancy disposition top effect which balanced it even if it becomes difficult to give sufficient fire retardancy for a Plastic solid since it is required for the content of a radical generating agent to consider as 0.0005 - 10 weight section to the vinyl chloride system resin 100 weight section and carbonization promotion operations run short under in the 0.0005 weight sections and it made the large quantity contain from 10 weight sections on the other hand is not seen, it becomes a waste of a radical generating agent. The still more desirable content of a radical generating agent is 0.05 - 5 weight section.

[0061] Next, Plastic solid A4 To the vinyl chloride system resin 100 weight section, it is the Plastic solid of monolayer structure which carries out 0.0005-10 weight section content of the cross linking agent among fire-resistant grant components, and is this Plastic solid A4. Proper quantity combination of the various additives, such as a stabilizer of a lead system or a tin system required for fabrication, lubricant, processing aid, and a coloring agent, is carried out.

[0062] As a cross linking agent, what starts bridge formation is suitable at the temperature of 200 degrees C or more higher than the fabricating-operation temperature of a vinyl chloride system resin, for example, triazine thiol compounds etc. are used preferably. In addition, a vinyl chloride system resin is above-mentioned Plastic solid A1. The same thing as what was used is used.

[0063] thus -- since crosslinking reaction does not produce Plastic solid A4 which made the vinyl chloride system resin contain the cross linking agent which acts at an elevated temperature at the time of fabrication and processing -- various configurations -- fabrication -- or fabricating can be carried out And in process in which it results in the combustion in case of a fire, since it is hard coming to gasify while macromolecule quantification of the polymer molecule of a vinyl chloride system resin is carried out by crosslinking reaction and thermal resistance is raised, the outstanding fire retardancy is demonstrated.

[0064] Since the fire retardancy disposition top effect which balanced it even if it becomes difficult to give sufficient fire retardancy for a Plastic solid since it is required for the content of a cross linking agent to consider as 0.0005 - 10 weight section to the vinyl chloride system resin 100 weight section and macromolecule quantification and gasification depressant action runs short under in the 0.0005 weight sections and it made the large quantity contain from 10 weight sections on the other hand is not seen, it becomes a waste of a cross linking agent. The still more desirable content of a cross linking agent is 0.05 - 5 weight section.

[0065] Above Plastic-solid A1 -A4 Although any one sort of the fire-resistant grant component is made to contain to a vinyl chloride system resin, you may make any two or more sorts of the fire-resistant grant component contain. In this case, Plastic-solid A5 described below It is desirable to use a foaming agent as an indispensable component like, and to make it contain combining this foaming agent and other fire-resistant grant components.

[0066] Namely, Plastic-solid A5 To the vinyl chloride system resin 100 weight section, in a foaming agent, it is the Plastic solid of the monolayer structure of 0.0005 - 10 weight section, the decomposition accelerator which are other fire-resistant grant components, a radical generating agent, and a cross linking agent of carrying out 0.0005-10 weight section content of any one sort at least, and optimum dose combination of the various additives, such as a stabilizer of a lead system or a tin system required for fabrication, lubricant, processing aid, and a coloring agent, is carried out.

[0067] A vinyl chloride system resin, the foaming agent which is a fire-resistant grant component, a decomposition accelerator, a radical generating agent, and a cross linking agent are the above-mentioned Plastic-solid A1 -A4. The same thing as what was used is used.

[0068] The foaming agent is more effective than other fire-resistant grant components, when suppressing early combustion, in order to intercept the heat from the outside by foaming in the stage in early stages of process in which it results in combustion. Therefore, above-mentioned Plastic-solid A5 which made this foaming agent indispensable and was made to contain more than combining a kind of other fire-resistant grant components While early combustion is enough suppressed by heat interception operation of a foaming agent, the outstanding fire retardancy is demonstrated after that according to the synergism of a heat interception operation of a foaming agent, and the carbonization promotion operation and gasification depressant action which other fire-resistant grant components mentioned above. And since the foam produced in disassembly of a foaming agent catches the occurring smoke and the corrosive gas, the amount's [the amount of emitting smoke or] of gas evolutions decreases.

[0069] Since the fire-resistant disposition top effect of having balanced it is not acquired even if it will become difficult to give sufficient fire retardancy and it will make [more] it conversely than this, if it is required to consider as 0.0005 - 10 weight section and it makes it fewer than this, the content of a foaming agent and the content of other fire-resistant grant components serve as a waste of a fire-resistant grant component. The still more desirable content of a foaming agent and other fire-resistant grant components is 0.05 - 5 weight section.

[0070] Fire-resistant vinyl chloride system resin Plastic solid A1 of monolayer structure - A5 which were explained above The vinyl chloride system resin constituent which chose and blended the fire-resistant grant component and the additive is fabricated in the configuration of requests, such as a plate, a pipe, the round bar, an angle, and other section shapes, with extrusion molding, a calender press, injection molding, and other well-known forming technique, and it is obtained. Such a Plastic solid is used for remaining as it is or the various uses as which fabricating is further carried out and fire retardancy is required.

[0071] Next, Plastic solid A6 of a double layer structure It is the Plastic solid which carried out the laminating unification of the surface layer at least at one side of a substratum. a substratum As opposed to the vinyl chloride system resin 100 weight section among fire-resistant grant components A decomposition accelerator, It is the layer of a radical generating agent and a cross linking agent which carries out 0.0005-10 weight section content of any one sort at least. a surface layer A foaming agent to the vinyl chloride system resin 100 weight section [whether 0-10 weight section content is carried out and] Or it becomes 0 - 10 weight section from the layer of the decomposition accelerator which are other fire-resistant grant components, a radical generating agent, and a cross linking agent which carries out 0.0005-10 weight section content of any one sort at least about a foaming agent. This Plastic solid A6 Optimum dose combination of the various additives, such as a stabilizer of a lead system or a tin system required for fabrication, lubricant, processing aid, and a coloring agent, is carried out also at a substratum or a surface layer.

[0072] Moreover, a vinyl chloride system resin, the foaming agent which is a fire-resistant grant component, a decomposition accelerator, a radical generating agent, and a cross linking agent are the above-mentioned Plastic-solid A1 -A4. The same thing as what was used is used.

[0073] Plastic solid A6 of such a double layer structure While the combustion depressor effect which was excellent in the first stage in the early stage of resulting in combustion with a heat interception operation of the foaming agent contained in a surface layer is demonstrated, the outstanding fire retardancy is demonstrated after that according to the synergism of a heat interception operation of a foaming agent, and the carbonization promotion operation and gasification depressant action of other fire-resistant grant components which are contained in a surface layer or a substratum. And since the foam produced in disassembly of the foaming agent of a surface layer catches the smoke and the corrosive gas which occur in a substratum, the amount's [the amount of emitting smoke or] of gas evolutions decreases.

[0074] The content of the decomposition accelerator which is the fire-resistant grant component of a substratum, a radical generating agent, and a cross linking agent, and the foaming agent of a surface layer and the content of other fire-resistant grant components If to consider as within the limits of the above is required, the content of the fire-resistant grant component of a substratum becomes less than the 0.0005 weight section and the content of the content of 0 weight section and other fire-resistant grant components of the foaming agent of a surface layer becomes less than the 0.0005 weight section It is Plastic solid A6 about sufficient fire retardancy. Giving becomes difficult. Since the fire-resistant disposition top effect of having balanced it is not acquired on the other hand even if the content of the fire-resistant grant component of a substratum exceeds 10 weight sections and the foaming agent of a surface layer and the content of other fire-resistant grant components exceed 10 weight sections, it becomes a waste of a fire-resistant grant component. The still more desirable content of the fire-resistant grant component in a substratum is 0.05 - 5 weight section, and the still more desirable contents of the foaming agent in a surface layer and other fire-resistant grant components are 0 - 5 weight section and 0.05 - 5 weight section.

[0075] Plastic solid A7 of another double layer structure As opposed to the vinyl chloride system resin 100 weight section in which the substratum has less than 58% of the degree of chlorination It is the layer of a foaming agent, a decomposition accelerator, a radical generating agent, and a cross linking agent which carries out 0.0005-10 weight section content of any one sort at least, and the surface layer which carried out laminating unification becomes at least one side of this substratum from the layer of the vinyl chloride system resin which has 58% or more of the degree of chlorination. This Plastic solid A7 Proper quantity combination of the various additives, such as a stabilizer of a lead system or a tin system required for fabrication, lubricant, processing aid, and a coloring agent, is carried out also at a substratum or a surface layer.

[0076] The general vinyl chloride resin whose degree of chlorination mentioned above is about 56% as a vinyl chloride system resin of a substratum is used suitably. And the back chlorinated polyvinyl chloride resin whose degrees of chlorination mentioned above are abbreviation 58 - 73% of abbreviation as a vinyl chloride system resin of a surface layer is used suitably, and 58% or more of mixed resin is also used for the degree of average chlorination which mixed general vinyl chloride resin, a vinyl acetate resin, acrylic resin, the vinyl chloride-vinyl acetate copolymerization resin, etc. to chlorinated polyvinyl chloride resin further after this. Moreover, a foaming agent, a decomposition accelerator, a radical generating agent, and a cross linking agent are the above-mentioned Plastic-solid A2 -A4. The same thing as what was used is used.

[0077] The degree of chlorination of a vinyl chloride system resin and fire retardancy have a positive correlation, and if the degree of chlorination forms a surface layer by 58% or more and the high vinyl chloride system resin as mentioned above in order to improve, even if fire retardancy does not make fire-resistant grant components, such as a foaming agent, completely contain, its fire retardancy of a surface layer will improve, so that the degree of chlorination becomes high. Therefore, Plastic solid A7 of this double layer structure A substratum is made to only contain a foaming agent, a decomposition accelerator, a

radical generating agent, or a cross linking agent, and the fire retardancy which was excellent as a whole can be given.

[0078] Since the fire-resistant disposition top effect of having balanced it will not be acquired even if it becomes difficult to give sufficient fire retardancy and it makes a large quantity contain from 10 weight sections on the other hand if the content of the foaming agent which is the fire-resistant grant component of a substratum, a decomposition accelerator, a radical generating agent, and a cross linking agent needs to consider as 0.0005 - 10 weight section and it becomes less than the 0.0005 weight sections, it becomes a waste of a fire-resistant grant component. The still more desirable content of the fire-resistant grant component in a substratum is 0.05 - 5 weight section.

[0079] Plastic solid A6 of the above-mentioned double layer structure, and A7 The vinyl chloride system resin constituent for substratum formation which chose and blended a fire-resistant grant component and other additives, The vinyl chloride system resin constituent for surface-layer formation which chose and blended a fire-resistant grant component and other additives, Or the vinyl chloride system resin constituent for surface-layer formation which does not contain a fire-resistant grant component is prepared. Laminate molding of these constituents is carried out to a desired configuration by the means of multilayer-extrusion fabrication, a calender press, a lamination, and others, and it is manufactured, and is used for remaining as it is or the various uses as which fabricating is carried out and fire retardancy is required.

[0080] Next, vinyl chloride system resin Plastic solid B which contained the titanium compound as either of the fire-resistant grant components is explained. As main operation forms of this Plastic solid B, it is Plastic solid B1 of the monolayer structure described below, B-2, B3, and B4. Plastic-solid B5 of a double layer structure, and B6 It is mentioned.

[0081] Plastic solid B1 the Plastic solid of monolayer structure which carries out 0.0005-10 weight section content of the foaming agent for a titanium compound among 5 - 50 weight section and a fire-resistant grant component to the vinyl-chloride-resin 100 weight section -- it is -- this Plastic solid B1 **** -- proper quantity combination of the various additives, such as a stabilizer of a lead system or a tin system required for fabrication, lubricant, processing aid, and a coloring agent, is carried out

[0082] As a titanium compound, titanium oxide, a potassium titanate, etc. are used and the fine particles which have the mean particle diameter which is about 0.1-0.5 micrometers are used especially preferably. The titanium oxide which has such a mean particle diameter, and the fine particles of a potassium titanate can have good kneading nature with a vinyl chloride system resin, and it can make them contain in the state of uniform distribution. Moreover, since smoke and gas have the advantage adsorbed with an alumina while carbonization of a vinyl chloride system resin is further promoted by the synergism of titanium oxide and an alumina at the time of combustion, the titanium oxide which covered the front face with the alumina is used very preferably.

[0083] In addition, a vinyl chloride system resin and a foaming agent are above-mentioned Plastic solid A1. The same thing as what was used is used.

[0084] This Plastic solid B1 Since the amount of the vinyl chloride system resin which is the organic substance decreases relatively, and a heat interception operation and a gas capture operation will be demonstrated also with a foaming agent while a heat interception operation and a carbonization promotion operation are demonstrated with a titanium compound in process in which it results in combustion as mentioned already if the titanium compound and the foaming agent contain like, it is Plastic solid B1. Fire retardancy improves and the amount of emitting smoke and the yield of a corrosive gas decrease. Moreover, when what starts foaming at the temperature of 200 degrees C or more higher than fabricating-operation temperature as a foaming agent is used, it cannot foam at the time of fabrication, but a hard Plastic solid can be obtained, and there is no fear of foaming also at the time of fabricating, such as bending.

[0085] The content of a titanium compound needs to consider as 5 - 50 weight section to the vinyl-chloride-resin 100 weight section, and the content of a foaming agent needs to be taken as 0.0005 - 10 weight section. When the content of a titanium compound exceeds 50 weight sections and the content of a foaming agent exceeds 10 weight sections, fire retardancy is Plastic solid B1, although it improves notably. Chemical resistance, intensity, bending nature, etc. fall. On the other hand, if the content of a titanium compound is less than 5 weight sections and the content of a foaming agent is less than the 0.0005 weight section, a heat interception operation and carbonization promotion acting will become inadequate, and it will become difficult to raise fire retardancy. The still more desirable content of 8 - 30 weight section and a foaming agent of the still more desirable content of a titanium compound is 0.05 - 10 weight section.

[0086] Next, Plastic-solid B-2 To the vinyl chloride system resin 100 weight section, it is the Plastic solid of monolayer structure which carries out 0.0005-10 weight section content of 5 - 50 weight section and the decomposition accelerator for a titanium compound, and is this Plastic-solid B-2. Optimum dose combination of the various additives, such as a lead system or a tin system stabilizer required for fabrication, lubricant, processing aid, and a coloring agent, is carried out.

[0087] A titanium compound is above-mentioned Plastic solid B1. The same thing as what was used is used, and a vinyl chloride system resin and a decomposition accelerator are above-mentioned Plastic solid A1 and A2. The same thing as what was used is used.

[0088] This Plastic-solid B-2 If the titanium compound and the decomposition accelerator contain like, since in addition to fire retardancy improving by a heat interception operation of a titanium compound and carbonization promotion operation disassembly of a vinyl chloride system resin will be promoted with a decomposition accelerator and carbonization will be further brought forward at the time of combustion, the outstanding fire retardancy is demonstrated. Moreover, if what acts at the elevated temperature of 200 degrees C or more as a decomposition accelerator is used, disassembly of a vinyl chloride system resin with a decomposition accelerator will not arise at the time of fabricating, such as the time of fabrication, and bending, but a Plastic solid with intensity and a bending object will be acquired.

[0089] The content of a titanium compound is aforementioned Plastic solid B1. It is necessary to consider as 5 - 50 weight section to the vinyl-chloride-resin 100 weight section, and to let the content of a decomposition accelerator similarly be 0.0005 - 10 weight section like a case. The reason is aforementioned Plastic solid B1. Since it is the same as that of a case, explanation is omitted. In addition, the still more desirable content of 8 - 30 weight section and a decomposition accelerator of the still more desirable content of a titanium compound is 0.0005 - 5 weight section.

[0090] Next, Plastic solid B3 To the vinyl chloride system resin 100 weight section, it is the Plastic solid of monolayer structure which carries out 0.0005-10 weight section content of 5 - 50 weight section and the radical generating agent for a titanium compound, and is this Plastic solid B3. Optimum dose combination of the various additives, such as a lead system or a tin system stabilizer required for fabrication, lubricant, processing aid, and a coloring agent, is carried out.

[0091] And a titanium compound is above-mentioned Plastic solid B1. The same thing as what was used is used, and a vinyl chloride system resin and a radical generating agent are above-mentioned Plastic solid A1 and A3. The same thing as what was used is used.

[0092] This Plastic solid B3 If a titanium compound and a radical generating agent are made to contain like, since in addition to fire retardancy improving by a heat interception operation of a titanium compound and carbonization promotion operation a radical will occur, disassembly of a vinyl chloride system resin will be promoted by the radical generating agent and carbonization will be further brought forward at the time of combustion, the outstanding fire retardancy is demonstrated. Moreover, if what acts at the elevated temperature of 200 degrees C or more as a radical generating agent is used, since a radical will not be generated at the time of fabrication and fabricating, there is no degradation of the vinyl chloride system resin at the time of fabrication and fabricating, and mold goods and a secondary-forming article with intensity can be obtained.

[0093] The content of a titanium compound is aforementioned Plastic solid B1. It is necessary to consider as 5 - 50 weight section to the vinyl-chloride-resin 100 weight section, and to let the content of a radical generating agent similarly be 0.0005 - 10 weight section like a case. Since the reason is the same as that of the case of aforementioned Plastic solid B1, explanation is omitted. In addition, the still more desirable content of 8 - 30 weight section and a radical generating agent of the still more desirable content of a titanium compound is 0.0005 - 5 weight section.

[0094] Next, Plastic solid B4 To the vinyl chloride system resin 100 weight section, it is the Plastic solid of monolayer structure which carries out 0.0005-10 weight section content of 5 - 50 weight section and the cross linking agent for a titanium compound, and is this Plastic solid B4. Proper quantity combination of the various additives, such as a lead system or a tin system stabilizer required for fabrication, lubricant, processing aid, and a coloring agent, is carried out.

[0095] And a titanium compound is above-mentioned Plastic solid B1. The same thing as what was used is used, and a vinyl chloride system resin and a cross linking agent are above-mentioned Plastic solid A1 and A4. The same thing as what was used is used.

[0096] this Plastic solid B4 if a titanium compound and a cross linking agent are made to contain like, fire retardancy will improve by a heat interception operation of a titanium compound and carbonization promotion operation -- in addition, macromolecule quantification of the resin is carried out by operation of the heat from the outside, and a cross linking agent, and since it is hard coming to gasify while thermal resistance is raised, the outstanding fire retardancy is demonstrated. Moreover, if what acts at the elevated temperature of 200 degrees C or more as a cross linking agent is used, since crosslinking reaction will not be produced at the time of fabrication, the Plastic solid obtained has the same good moldability as usual, and can carry out fabricating to various configurations.

[0097] The content of a titanium compound is aforementioned Plastic solid B1. It is necessary to consider as 5 - 50 weight section to the vinyl-chloride-resin 100 weight section, and to let the content of a cross linking agent similarly be 0.0005 - 10 weight section like a case. Since the reason is the same as that of the case of aforementioned Plastic solid A, explanation is omitted. In addition, the still more desirable content of 8 - 30 weight section and a cross linking agent of the still more desirable content of a titanium compound is 0.05 - 5 weight section.

[0098] Above Plastic solid B1, B-2, B3, and B4 It sets, and even if there are still few chlorine capture compounds or minerals assistants, you may carry out 2-30 weight section content of any one sort. If a chlorine capture compound is made to contain, since chlorine will be captured with a chlorine capture compound at the time of combustion, if the yield of corrosive gases, such as chlorine gas and hydrogen chloride gas, decreases further and a minerals assistant is made to contain, in order for a titanium compound and a minerals assistant to multiply and to promote carbonization of a vinyl chloride system resin further, the amount of emitting smoke decreases further and fire retardancy improves further.

[0099] As a chlorine capture compound, carbonates, such as a calcium carbonate, a lithium carbonate, and a magnesium carbonate, are suitable, and especially, since it is desirable, specific surface area is large and 0.5 micrometers or less of mean particle diameters tend to react with chlorine, the fine particles of a carbonate 0.1 micrometers or less are used very suitably. In addition, a tin compound, a zeolite, a barium sulfate, a potassium titanate, a sodium compound, a magnesium compound, an aluminium compound, a lithium compound, etc. are used.

[0100] Moreover, as a minerals assistant, it is independent, or they are used by a silica, an alumina, aluminum silicate, two or more sorts of talc, etc., mixing.

[0101] The content of a chlorine capture compound or a minerals assistant needs to consider as 2 - 30 weight section, when fewer than 2 weight sections, the yield of a corrosive gas or smoke seldom decreases, but the further fire-resistant improvement also becomes difficult. On the other hand, when a content exceeds 30 weight sections, the chemical resistance of a Plastic solid, intensity, bending nature, a moldability, etc. fall. The still more desirable content of a chlorine capture

compound is 7 - 20 weight section, and the still more desirable content of a minerals assistant is 2 - 15 weight section.

[0102] In addition, Plastic solid A1 of monolayer structure - A5 which mentioned above an above-mentioned chlorine capture compound or an above-mentioned minerals assistant Plastic solid A6 of the double layer structure which 2-30 weight section content was carried out similarly, and you may make it raise fire retardancy further, and was mentioned above, and A7 You may make a substratum contain.

[0103] Plastic solid B1 of monolayer structure explained above, B-2, B3, and B4 The Plastic solid which made these contain a chlorine capture compound or a minerals assistant further A titanium compound, a foaming agent, a cross linking agent, a radical generating agent, a decomposition accelerator, a chlorine capture compound, It fabricates in the configuration of a request of the vinyl chloride system resin constituent which chose and blended a minerals assistant, other additives, etc. of monotonous and others with extrusion molding, a calender press, injection molding, and other well-known forming technique, and is obtained. such a Plastic solid -- as it is -- or fabricating is carried out further, a container etc. is manufactured and it is used suitable for various uses, especially semiconductor fabrication machines and equipment, etc.

[0104] Next, Plastic-solid B5 of a double layer structure The substratum is a layer which carries out 5-50 weight section content of the titanium compound to the vinyl chloride system resin 100 weight section, and the surface layer which carried out laminating unification becomes at least one side of this substratum from the layer which carries out 0.0005-10 weight section content in 0 - 30 weight section and a foaming agent about a titanium compound to the vinyl chloride system resin 100 weight section. As for the content of the titanium compound of a surface layer, it is desirable to make it contain fewer than that of a substratum.

[0105] A vinyl chloride system resin, a titanium compound, and a foaming agent are aforementioned Plastic solid B1. The same thing as what was used is used, and optimum dose combination of the various additives, such as a lead system or a tin system stabilizer required for fabrication, lubricant, processing aid, and a coloring agent, is carried out at a substratum and a surface layer.

[0106] The above-mentioned surface layer is Plastic-solid B5. Since it is for suppressing surface physical properties especially chemical resistance, and a corrosion-resistant fall, although forming in both sides of a substratum is desirable, it is enough, if it may be formed only in one side of a substratum and there is about 0.4-1.1mm of the thickness.

[0107] Plastic-solid B5 of such a double layer structure Since there are few contents of the titanium compound of a surface layer as [below] 30 weight sections, it is Plastic-solid B5. A front face has the good chemical resistance and the good corrosion resistance of vinyl chloride system resin original, and the embrittlement of the surface layer is not carried out. And since 5-50 weight section content of the titanium compound which demonstrates a heat interception operation and a carbonization promotion operation to the substratum of this Plastic solid is carried out and 0.0005-10 weight section content of the foaming agent which demonstrates a heat interception operation and a gas capture operation to a surface layer is carried out, it is this Plastic-solid B5. It has the fire retardancy which was excellent as a whole.

[0108] Since the amount of vinyl chloride system resins of a surface layer will decrease too much, it will become impossible to maintain the good chemical resistance of vinyl chloride system resin original, and corrosion resistance and the intensity of a surface layer will also fall although the fire retardancy of a surface layer improves if the content of the titanium compound of a surface layer exceeds 30 weight sections, the content of a titanium compound needs to carry out to below 30 weight sections as mentioned above. Although considering as zero is also possible, the content of a titanium compound makes thickness of a surface layer thin at this time, and should just make [many] the content of the titanium oxide of a substratum.

[0109] Furthermore, in order for intensity to also fall while the chemical resistance and the corrosion resistance of a surface layer fall if a heat interception operation and gas capture acting according to foaming become inadequate if the content of the foaming agent of a surface layer becomes less than the 0.0005 weight section and it increases more than 10 weight sections conversely, the content of the foaming agent of a surface layer needs to be taken as 0.0005 - 10 weight section as mentioned above. In addition, the still more desirable content of the titanium compound of a surface layer is 3 - 15 weight section, and the still more desirable content of a foaming agent is 0.05 - 10 weight section.

[0110] Moreover, if the content of the titanium compound of a substratum becomes less than 5 weight sections, it will become difficult to raise fire retardancy, and if a large quantity is made to contain from 50 weight sections, in order for the intensity of a substratum, bending nature, etc. to fall, the content of the titanium compound in a substratum needs to be taken as 5 - 50 weight section as mentioned above.

[0111] This Plastic-solid B5 It is desirable especially to set, to be making the content of the titanium compound of a surface layer fewer than that of a substratum, to suppress the influence of the chemical resistance on a titanium compound as much as possible, and to raise fire retardancy by the substratum. Therefore, making 3 - 15 weight section and a substratum carry out 15-35 weight section content of the titanium compound is preferably adopted as a surface layer.

[0112] Next, Plastic-solid B6 of a double layer structure It is the Plastic solid which carried out the laminating unification of the surface layer at least at one side of a substratum. a substratum As opposed to the vinyl chloride system resin 100 weight section a titanium compound 5 - 50 weight section, It is the layer of a radical generating agent and a decomposition accelerator which carries out 0.0005-10 weight section content of any one sort at least, and a surface layer consists a titanium compound of a layer which carries out 0.0005-10 weight section content in 0 - 30 weight section and a foaming agent to the vinyl chloride system resin 100 weight section.

[0113] A vinyl chloride system resin, a titanium compound, a foaming agent, a radical generating agent, and a decomposition accelerator are aforementioned Plastic solid B1, B-2, and B3. The same thing as what was used is used and optimum dose combination of the various additives, such as a lead system or a tin system stabilizer required for a substratum and a surface

layer, lubricant, processing aid, and a coloring agent, is carried out. Moreover, the thickness of a surface layer is aforementioned Plastic-solid B5. It is the same as that of the thickness of a surface layer.

[0114] This Plastic-solid B6 A surface layer is aforementioned Plastic-solid B5. Since it is the same composition as a surface layer, the front face has good chemical resistance and good corrosion resistance. And in a substratum, it is aforementioned Plastic-solid B-2 and B3. Since a decomposition accelerator and a radical generating agent are contained similarly and a foaming agent is contained in a surface layer, the corrosive gas produced in early disassembly of the vinyl chloride system resin of a substratum and smoke are captured with the foam generated with the foaming agent of a surface layer, and carbonization promotion and gas capture are performed with sufficient balance. Therefore, this Plastic-solid B6 It has the fire retardancy which was excellent as a whole.

[0115] In addition, Plastic-solid B5 of these double layer structures and B6 It also sets, and it is possible to make a substratum carry out 2-30 weight section content of an above-mentioned chlorine capture compound and an above-mentioned minerals assistant, fire retardancy improves further in that case, and the amount of emitting smoke and the amount of corrosion-resistant generation of gas decrease.

[0116] Plastic-solid B5 of these double layer structures, and B6 The vinyl chloride system resin constituent for substratum fabrication which chose and blended a titanium compound, a radical generating agent, a decomposition accelerator, a chlorine capture compound, a minerals assistant, other additives, etc., The vinyl-chloride-resin constituent for surface-layer fabrication which blended a titanium compound, a foaming agent, other additives, etc. is prepared. these constituents by the means of multilayer-extrusion fabrication, a calender press, a lamination, and others Laminated molding is carried out to a desired configuration, and it is manufactured, and in addition to the outstanding fire retardancy, since surface chemical resistance and corrosion resistance are good, it is suitably used as material, such as the use as which surface chemical resistance etc. is required, for example, the washing tub which are some semiconductor fabrication machines and equipment.

[0117] In addition, fire-resistant vinyl-chloride-resin Plastic-solid B5 of the above-mentioned double layer structure and B6 Although a surface layer is made to contain a titanium compound and a foaming agent, it may replace with a foaming agent and the decomposition accelerator which are other fire-resistant grant components, a radical generating agent, or a cross linking agent may be made to contain.

[0118] Next, Plastic solid C which does not contain a fire-resistant grant component is explained including a titanium compound.

[0119] This Plastic solid C is a Plastic solid of monolayer structure which carries out 5-50 weight section content of the potassium titanate to the vinyl chloride system resin 100 weight section, and optimum dose combination of the various additives, such as a lead system or a tin system stabilizer required for fabrication, lubricant, processing aid, and a coloring agent, is carried out at this Plastic solid C. what was used for each above-mentioned Plastic solid as a vinyl chloride system resin -- the same thing is used

[0120] If 5-50 weight section content of the potassium titanate which is a titanium compound is carried out like this Plastic solid C, in order that a potassium titanate may demonstrate a heat interception operation and a carbonization promotion operation in case of a fire, fire retardancy improves and the yield of smoke or a corrosive gas decreases.

[0121] Although things of any configurations, such as what has a granular potassium titanate, and a fibrous thing, are used, the granular thing whose mean particle diameter is 0.1-0.5 micrometers has good kneading nature, and the diameter of fiber can obtain the Plastic solid of the high rigidity [thing / fibrous / whose length is 5-30 micrometers in 0.1-1 micrometer] in high intensity.

[0122] The content of a potassium titanate needs to consider as 5 - 50 weight section, and under in 5 weight sections, if it becomes difficult to raise fire retardancy and a large quantity is made to contain from 50 weight sections, the chemical resistance of Plastic solid C, intensity, bending nature, etc. will fall. The still more desirable content of a potassium titanate is 8 - 30 weight section.

[0123] Plastic solid C of such monolayer structure is fabricated in the configuration of a request of the vinyl chloride system resin constituent which chose and blended the additive of a potassium titanate and others etc. of monotonous and others with extrusion molding, a calender press, injection molding, and other well-known forming technique, is obtained, and is used for remaining as it is or the various uses as which fabricating is further carried out and thermal resistance is required.

[0124] Next, transparent Plastic solid D which contains either of the fire-resistant grant components as preferably as the Lynn system flame retarder or a zinc compound is explained. Plastic solid D1 of the monolayer structure which uses a vinyl chloride system resin with the high degree of chlorination as main operation forms of this Plastic solid D, Plastic solid D3 of the monolayer structure which uses a vinyl chloride system resin with ordinary D2 and degree of chlorination, Plastic solid D4 of the laminated structure which uses either or the both sides of a vinyl chloride system resin with the high degree of chlorination, and a vinyl chloride system resin with the ordinary degree of chlorination, D5, D6, and D7 etc. -- it can mention

[0125] first, transparent Plastic solid D1 using a vinyl chloride system resin with the as high degree of chlorination as abbreviation 58 - 73% of abbreviation As opposed to this vinyl chloride system resin 100 weight section the Lynn system flame retarder 0.5 - 15 weight section, In considering as basic composition what carried out 0.5-7 weight section content of 0.5 - 20 weight section and the tin system stabilizer for the chlorinated polyethylene and asking for it Furthermore, even if there are few a foaming agent which is a fire-resistant grant component, decomposition accelerators, radical generating agents, and cross linking agents, 0.0005-10 weight section content of a kind is carried out.

[0126] As a vinyl chloride system resin whose degrees of chlorination are abbreviation 58 - 73% of abbreviation, the mixed resin whose degrees of average chlorination which mixed the same thing as what was used for the surface layer of

above-mentioned Plastic solid A7, i.e., the back chlorinated polyvinyl chloride resin whose degrees of chlorination are abbreviation 58 - 73% of abbreviation, vinyl chloride resin general to chlorinated polyvinyl chloride resin after this, a vinyl acetate resin, acrylic resin, a vinyl chloride-vinyl acetate copolymerization resin, etc. are abbreviation 58 - 73% of abbreviation is used. Among these, the thing of back chlorinated polyvinyl chloride resin is used preferably.

[0127] In order that the above-mentioned vinyl chloride system resin with the as high degree of chlorination as abbreviation 58 - 73% of abbreviation may generate a lot of chlorine gas by the pyrolysis compared with the general vinyl chloride resin whose degree of chlorination is 56% of abbreviation and may delay combustion, it is a material resin advantageous to obtaining the Plastic solid excellent in fire retardancy. A resin with the higher degree of chlorination from a fire-resistant viewpoint is more advantageous, and the vinyl chloride system resin with the higher ** than 73% of abbreviation degree of chlorination is difficult to manufacture, and since thermal stability, a moldability, bending nature, chemical resistance, corrosion resistance, etc. are bad, it is unsuitable as a raw material resin.

[0128] As the above-mentioned Lynn system flame retarder which a vinyl chloride system resin is made to contain ** halogen phosphoric ester, ** halogen condensation phosphoric ester, non-halogen phosphoric ester, The thing of organic-phosphorus systems, such as non-halogen condensation phosphoric ester and orthophosphoric-acid ester, is suitable. For example, tris (chloro ethyl) phosphate, tris (chloropropyl) phosphate, Tris (dichloro propyl) phosphate, trimethyl phosphate, triphenyl phosphate, tricresyl phosphate, cresyl diphenyl phosphate, 2-ethylhexyl diphenyl phosphate, etc. are used preferably.

[0129] Since it excels in transparency compared with flame retarders, such as a halogen system flame retarder and an antimony oxide, such an organic-phosphorus system flame retarder is transparent Plastic solid D1. Are advantageous to obtaining. moreover, at the time of combustion While this organic-phosphorus system flame retarder pyrolyzes, a phosphoric acid is generated, and this phosphoric acid remains on the front face of a vinyl chloride system resin and bars oxygen transfer, in order to promote surface carbonization and to suppress combustion, it is Plastic solid D1. Fire retardancy can be raised. Moreover, since this organic phosphoric ester acts also as internal lubricant or external lubricant, it has the advantage which does not need to use the lubricant which does not give fire retardancy, such as other higher fatty acids.

[0130] In addition, inorganic-phosphorus system flame retarders, such as red phosphorus, are also usable in the range which does not spoil transparency.

[0131] It acts also as a reinforcing agent, a mechanical strength is raised, and the above-mentioned chlorinated polyethylene which a vinyl chloride system resin is made to contain is Plastic solid D1. A required practical strength is given. As for this chlorinated polyethylene, that the degree of chlorination of whose is 25 - 45% is used suitably. If this chlorinated polyethylene is made to contain, in order that the chlorine gas which occurs by the pyrolysis may delay combustion of a resin, it is Plastic solid D1. Fire retardancy can be raised. Since there are few yields of chlorine gas, less than 25% of chlorinated polyethylene has the degree of chlorination disadvantageous for fire-resistant improvement, and since there is un-arranging [that the reinforcement effect of the degree of chlorination seldom improves, as for 45% or more of chlorinated polyethylene], it is not desirable. In addition, although the thing of acrylic or a MBS system is also considered as a reinforcing agent, since these do not have a fire-resistant operation, they are not desirable.

[0132] It is necessary to carry out 0.5-15 weight section content of the aforementioned Lynn system flame retarder to the vinyl chloride system resin 100 weight section, and a chlorinated polyethylene needs to carry out 0.5-20 weight section content. For each content of the Lynn system flame retarder and a chlorinated polyethylene, the case of under the 0.5 weight section is Plastic solid D1. It becomes difficult to fully raise fire retardancy. If it will come to cause the fall of transparency on the other hand if the content of the Lynn system flame retarder increases more than 15 weight sections, and the content of a chlorinated polyethylene increases more than 20 weight sections, transparency will fall and all required light transmissions will not be obtained. It of 2 - 10 weight section and a chlorinated polyethylene of the desirable content of the Lynn system flame retarder is 3 - 15 weight section.

[0133] Since combination of a plasticizer or lubricant weakens fire retardancy and reduces transparency, it is desirable to make it not blend as much as possible, and not blending, if it can do is desirable. However, you have to blend the tin system stabilizer which is a thermostabilizer. As a tin system stabilizer, what [all] has a conventionally well-known dibutyltin maleate system, a conventionally well-known dibutyltin laurate system, etc. is usable, and the content needs to be taken as 0.5 - 7 weight section to the vinyl chloride system resin 100 weight section. Under in the 0.5 weight section, the thermal stability at the time of fabrication falls, and since the heat stabilizing effect corresponding to it is not obtained even if it blends mostly from 7 weight sections on the other hand, it becomes futility. In addition, the stabilizer of a lead system is unsuitable when obtaining the Plastic solid of a transparent vinyl chloride system resin.

[0134] fire-resistant vinyl chloride system resin Plastic solid D1 with the above transparent basic composition **** -- the foaming agent which is the fire-resistant grant component mentioned above, a decomposition accelerator, a radical generating agent, and a cross linking agent -- any one sort is made to contain at least, fire retardancy may be raised further, or an ultraviolet ray absorbent is made to contain and weatherability may be raised

[0135] The above-mentioned fire-resistant grant component is Plastic solid D1, when it is required to make it contain at a rate of 0.0005 - 10 weight section to the vinyl chloride system resin 100 weight section and a content becomes less than the 0.0005 weight section. It becomes difficult to raise fire retardancy further, and on the other hand, since the fire-resistant disposition top effect of having balanced it is not acquired even if it makes [more] a content than 10 weight sections, it becomes useless. Each desirable content of a fire-resistant grant component is [at 0.0005 - 5 weight section and a radical generating agent] 0.005 - 5 weight section with 0.05 - 10 weight section and a decomposition accelerator in a foaming agent in 0.0005 - 5 weight section and a cross linking agent.

[0136] In addition, you may carry out optimum dose combination in the range which does not check fire retardancy for coloring agents, ultraviolet ray absorbents, etc., such as a pigment and a color, to the above-mentioned constituent.

[0137] Plastic solid D1 of the basic composition mentioned above When the thickness is 5mm, the Hayes value serves as [all light transmissions] 60% or less of transparent Plastic solid 50% or more, and lighting nature and transillumination nature are good. The values with desirable all above-mentioned light transmissions and Hayes value are 70% or more and 30% or less, respectively. And Plastic solid D1 of this basic composition Since fire retardancy is raised to the top where the degree of chlorination of a vinyl chloride system resin is high by the Lynn system flame retarder and the chlorinated polyethylene, there are also few amounts of emitting smoke that it is hard to burn. Moreover, fire retardancy of the Plastic solid which made the fire-resistant grant component contain further improves further.

[0138] Another transparent Plastic solid D2 using a vinyl chloride system resin with the as high degree of chlorination as abbreviation 58 - 73% of abbreviation To this vinyl chloride system resin 100 weight section, even if there are few a foaming agent which are 0.5 - 7 weight section and a fire-resistant grant component about 0.5 - 15 weight section and a tin system stabilizer in either the Lynn system flame retarder or a chlorinated polyethylene, decomposition accelerators, radical generating agents, and cross linking agents, 0.0005-10 weight section content of a kind is carried out.

[0139] As the vinyl chloride system resin whose degrees of chlorination are abbreviation 58 - 73% of abbreviation, the Lynn system flame retarder, a chlorinated polyethylene, and a tin system stabilizer, it is above-mentioned Plastic solid D1. What the same thing as what was used was used, and was mentioned already as a fire-resistant grant component is used. Moreover, the desirable content is also Plastic solid D1. It is the same.

[0140] This Plastic solid D2 Although the Hayes value becomes [all light transmissions] 60% or less 40% or more and lighting nature and fluoroscopy nature are good when thickness is 5mm, it is good preferably that all light transmissions adjust the content of each component within the limits of the above-mentioned content so that the Hayes value may become 30% or less 60% or more.

[0141] This Plastic solid D2 Like, when [of the foaming agent which is a fire-resistant grant component, a decomposition accelerator, a radical generating agent, and a cross linking agent] blending a kind as an indispensable component at least It is Plastic solid D2 by this fire-resistant grant component. Since fire retardancy is raised Above-mentioned Plastic solid D1 It is Plastic solid D2 only at it becoming unnecessary to make the both sides of the Lynn system flame retarder and a chlorinated polyethylene contain like, and making either the Lynn system flame retarder or a chlorinated polyethylene contain. It becomes possible to give the outstanding fire retardancy.

[0142] When the content of either the Lynn system flame retarder or a chlorinated polyethylene is made fewer than the 0.5 weight section and the content of a fire-resistant grant component is made fewer than the 0.0005 weight section, it is Plastic solid D2. Transparency is Plastic solid D2, although it improves. It becomes difficult to raise fire retardancy notably. On the other hand, even if it makes [more] the content of either the Lynn system flame retarder or a chlorinated polyethylene than 15 weight sections and makes [more] the content of a fire-resistant grant component than 10 weight sections, the fire-resistant disposition top effect of having balanced it is not acquired, but it is Plastic solid D2 on the contrary. The sharp fall of transparency will be caused.

[0143] In addition, this Plastic solid D2 It is possible to also set and to carry out proper quantity combination of coloring agents, ultraviolet ray absorbents, etc., such as a pigment and a color, in the range which does not check fire retardancy.

[0144] above transparent fire-resistant vinyl chloride system resin Plastic solids D1 and D2 the resin constituent which blended the Lynn system flame retarder, and the both sides and tin system stabilizer of a chlorinated polyethylene with the vinyl chloride system resin whose degrees of chlorination are abbreviation 58 - 73% of abbreviation -- or The resin constituent of the Lynn system flame retarder or either of the chlorinated polyethylenes and a tin system stabilizer, and a fire-resistant grant component which blended a kind at least is prepared to the vinyl chloride system resin whose degrees of chlorination are abbreviation 58 - 73% of abbreviation. These resin constituents with melting extrusion molding, calender press forming, injection molding, and other well-known forming meanses what is manufactured by fabricating in the configuration of requests, such as section shapes, such as a plate, a pipe, the round bar, an electrode, and an angle, -- it is -- as it is -- or fabricating is carried out and it is used for various kinds of uses In addition, Plastic solid D1 and D2 Although what is necessary is for there to be no limit about thickness and just to determine suitably in consideration of a use etc., if it is made the thickness of about 3-15mm, sufficient practical strength can usually be given.

[0145] Next, Plastic solid D3 using a vinyl chloride system resin To this vinyl chloride system resin 100 weight section, a zinc compound is converted into the amount of metal zinc, 0.5-7 weight section content of 0.005 - 5 weight section and the tin system stabilizer is carried out, all the light transmissions are 40% or more, and the Hayes value is 60% or less of transparent Plastic solid. This Plastic solid D3 Since disassembly of a vinyl chloride system resin is promoted with a zinc compound and carbonization is brought forward, it has the outstanding fire retardancy. The ranges with desirable all light transmissions and Hayes value are 60% or more and 30% or less, respectively, and it is desirable to adjust the content of a zinc compound or a tin system stabilizer within the limits of the above so that such all light transmissions and the Hayes value may be acquired.

[0146] As a vinyl chloride system resin, the general vinyl chloride resin whose degree of chlorination is 56.4%, the back chlorinated polyvinyl chloride resin whose degree of chlorination is 57 - 73%, the resin which mixed these resins and made the degree of chlorination the favorite thing, and the resin which mixed kinds, such as a vinyl acetate resin and a vinyl chloride-vinyl acetate copolymerization resin, or two sorts to these vinyl chloride resin are used. When the vinyl chloride system resin whose degree of chlorination is 58 - 73% of abbreviation among these resins is used, it is desirable although ***** excellent in fire retardancy is obtained. Moreover, if the vinyl chloride resin whose degree of chlorination is 56.4% is

used, since it can consider as the Plastic solid excellent in chemical resistance, carbonization is moreover brought forward with a zinc compound and fire retardancy can be given from the resin whose degree of chlorination is 58 - 73%, it is used preferably.

[0147] The zinc stearate used as the above-mentioned decomposition accelerator as a zinc compound, lauric-acid zinc, benzoic-acid zinc, etc. are suitable, and if such a zinc compound is made to contain, since carbonization of a vinyl chloride system resin will be promoted by the good thermal conductivity of the pitch solution promotion operation metallurgy group zinc of a zinc compound at the time of combustion, it becomes the Plastic solid excellent in fire retardancy. It will be bad opaque, if it becomes difficult to give sufficient fire retardancy for a Plastic solid if the content of a zinc compound converts into the amount of metal zinc and becomes less than the 0.005 weight section and it increases more than 5 weight sections on the other hand. Since the zinc content of each zinc compound is 14.5%, it makes each zinc compound contain with 14.0% and PARATA challs butyl benzoic-acid zinc, with 10.5% and lauric-acid zinc, by the zinc stearate so that the amount of metal zinc may serve as the above-mentioned range. In addition, it can be managed, even if others do not make it opaque, it does not reduce the lubricant which make it easy to burn or it does not use it, since a zinc compound acts also as lubricant.

[0148] Moreover, as a tin system stabilizer, what has the conventionally well-known above-mentioned dibutyltin maleate system, a conventionally well-known dibutyltin laurate system, etc. is used, and the content is the same as that of above-mentioned Plastic solid D1 and the case of D2.

[0149] in addition, this Plastic solid D3 **** -- proper quantity combination of a plasticizer, lubricant, processing aid, a coloring agent, the ultraviolet ray absorbent, etc. is carried out other than the above-mentioned zinc compound and a tin system stabilizer

[0150] fire-resistant vinyl chloride system resin Plastic solid D3 of the above composition **** -- the above-mentioned foaming agent which is a fire-resistant grant component, a decomposition accelerator, a radical generating agent, and a cross linking agent -- any one sort may be made to contain further at least, and fire retardancy may be raised further The content of a fire-resistant grant component is above-mentioned Plastic solid D1 and D2. It is the same as that of a case.

[0151] Such Plastic solid D3 Besides a zinc compound and a tin system stabilizer, plasticizer, The vinyl chloride system resin constituent which carried out proper quantity combination of the fire-resistant grant component etc. lubricant, processing aid, and if needed is prepared. above-mentioned Plastic solid D1 and D2 what is manufactured by fabricating with melting extrusion molding, calender press forming, injection molding, and other well-known forming means in a desired configuration like a case -- it is -- as it is -- or fabricating is carried out and it is used for various kinds of uses

[0152] Plastic solid D1 explained above, D2, and D3 Plastic solid D4 of the following laminated structures which formed the surface layer in both sides or one side of a substratum, for example although each was the thing of monolayer structure, D5, D6, and D7 ***** -- it is good

[0153] Namely, Plastic solid D4 As opposed to the vinyl chloride system resin 100 weight section whose degrees of chlorination are abbreviation 58 - 73% of abbreviation While carrying out 0.5 - 15 weight section for the Lynn system flame retarder and carrying out 0.5-7 weight section content of 0.5 - 20 weight section and the tin system stabilizer for a chlorinated polyethylene If needed, a kind was made to contain further at least and a fire-resistant grant component forms a substratum with a thickness of 2-14mm. a surface layer the degree of chlorination is 56% of abbreviation, while carrying out vinyl chloride system resin 100 weight ****, converting a zinc compound into the amount of metal zinc and carrying out 0.5-7 weight section content of 0.005 - 5 weight section and the tin system stabilizer A plasticizer, lubricant, processing aid, etc. and if needed, it is the thing of a fire-resistant grant component which carried out optimum dose combination of a kind at least, and forms in a layer with a thickness of 0.4-2mm.

[0154] Plastic solid D4 of such a laminated structure The thermal stability at the time of fabrication is good, and a surface layer is not only excellent in chemical resistance and corrosion resistance, but moreover, since the pyrolysis difference of the thickness direction is lost, it becomes the thing excellent in fire retardancy.

[0155] Moreover, Plastic solid D5 As opposed to the transparent vinyl chloride system resin 100 weight section whose degrees of chlorination are abbreviation 58 - 73% of abbreviation 0.5 - 15 weight section and a chlorinated polyethylene for the Lynn system flame retarder 0.5 - 20 weight section, Made the basic composition which carried out 0.5-7 weight section content of the tin system stabilizer carry out 0.0005-10 weight section content of the further aforementioned decomposition accelerator, and a substratum with a thickness of 2-14mm is formed in it. It is the Plastic solid which this basic composition was made to carry out 0.0005-10 weight section content of the foaming agent further, and formed the surface layer with a thickness of 0.4-2mm in it.

[0156] Such Plastic solid D5 Since there are few content total amounts occupied in the Plastic solid of a foaming agent, transparency is good, and moreover, since the smoke decomposed and produced in a substratum at the time of combustion and hydrogen chloride gas are incorporated by the foam produced by foaming of a surface layer, the vaporizing capacity demonstrates the fire retardancy which was excellent few. In this case, chemical resistance can be raised by using the resin to which the low resin of the degree of chlorination or general vinyl chloride resin was added, and the apparent degree of chlorination was reduced from the thing of a substratum as a resin of a surface layer.

[0157] Moreover, Plastic solid D6 As opposed to the general vinyl chloride system ** 100 weight section whose degree of chlorination is 56% of abbreviation The zinc compound was converted into the amount of metal zinc, 0.5-7 weight section content of 0.005 - 5 weight section and the tin system stabilizer is carried out, and a substratum with a thickness of 2-14mm is formed. a surface layer While carrying out 0.5-7 weight section content of the tin system stabilizer to the vinyl chloride system resin 100 weight section whose aforementioned degree of chlorination is 56% of abbreviation, it is the Plastic solid

which was made to carry out 0.0005-10 weight section content of the foaming agent, and was formed in the layer with a thickness of 0.4-2mm.

[0158] Such Plastic solid D6 Since the amount of generation of gas can be decreased by incorporating a case by the air bubbles which produce the gas produced in a substratum in a surface layer, the outstanding fire retardancy is demonstrated. In addition, you may carry out proper quantity combination of a plasticizer, processing aid, or the ultraviolet ray absorbent at a substratum or a surface layer.

[0159] Moreover, Plastic solid D7 As opposed to the general vinyl chloride system resin 100 weight section whose degree of chlorination is 56% of abbreviation A tin system stabilizer 0.5 - 7 weight section, a foaming agent, a decomposition accelerator, a radical generating agent, 0.0005-10 weight section content of any one sort is carried out at least, and a cross linking agent forms a substratum with a thickness of 2-14mm. a surface layer It is the Plastic solid by which the degree of chlorination carries out 0.5-7 weight section content of 0.5 - 20 weight section and the tin system stabilizer, and formed the Lynn system flame retarder and/or the chlorinated polyethylene in the layer with a thickness of 0.4-2.0mm to the vinyl chloride system resin 100 weight section which is 58 - 73%.

[0160] Such Plastic solid D7 A substratum is carried out with a foaming agent etc., flameproofing of the surface layer is carried out by the Lynn system flame retarder etc., respectively, and a case demonstrates the outstanding fire retardancy.

[0161] Next, the still more concrete example of this invention is explained.

[0162] To the vinyl-chloride-resin (U-PVC) 100 weight section whose degree of chlorination of [examples 1-4] marketing is 56% of abbreviation, the lead stabilizer 4 weight section, the lubricant 2 weight section, and the processing aid 4 weight section were added, it mixed uniformly, and the basic combination constituent (U-PVC use) was prepared. As opposed to this basic constituent 110 weight section as a foaming agent an AZOJI carvone amide A triazine thiol as a radical generating agent as a cross linking agent JIAMI looper oxide After mixing lauric-acid zinc alternatively at a rate shown in Table 1 as a decomposition accelerator, preparing four kinds of resin constituents and producing calendered sheeting with these resin constituents, by pressing The fire-resistant vinyl-chloride-resin board (5mm in thickness) of the monolayer structure which is four kinds from which composition differs was obtained.

[0163] And the four above-mentioned kinds of resin boards (50x50x5mm) were put into the electric furnace heated at 800 degrees C, the existence of ignition and the time of until it lights were investigated, and the fire-resistant test was performed. The result is shown in the following table 1.

[0164] Moreover, about each above-mentioned resin board, the mechanical strength and chemical resistance were investigated and the result was collectively shown in Table 1. This mechanical strength is JIS. Chemical resistance observes the appearance discoloration after flooding with each medical fluid of aqueous ammonia for seven days at 23 degrees C a sulfuric acid, 35% sulfuric acid, and 28% 97% by measuring tensile strength and a pace of expansion in the Izod shock strength based on K6745, x is slightly made into those remarkable with discoloration by being made those with discoloration, and ** into those with discoloration, and discoloration nothing and O are displayed for O.

[0165] To the back chlorinated-polyvinyl-chloride-resin (C-PVC) 100 weight section whose degree of [example 5] chlorination is 64% of abbreviation, the lead stabilizer 4 weight section, the lubricant 2 weight section, and the processing aid 4 weight section were added, it mixed uniformly, and the basic combination constituent (C-PVC use) was prepared. After having carried out 0.5 weight section mixture of the lauric-acid zinc as a decomposition accelerator, preparing the resin constituent to this basic combination constituent 110 weight section and producing calendered sheeting using this resin constituent, the fire-resistant vinyl-chloride-resin board (5mm in thickness) of monolayer structure was obtained by pressing.

[0166] And while performing the fire-resistant test like examples 1-4 about this resin board, the mechanical strength and chemical resistance were investigated. The result is shown in the following table 1.

[0167] While carrying out 0.5 weight section combination of the JIAMI looper oxide as a radical generating agent and preparing the constituent for substrata to the basic combination constituent (U-PVC use) 110 weight section prepared in the [example 6] examples 1-4, to the basic combination constituent 110 weight section prepared in the examples 1-4, 0.5 weight section combination of the AZOJI carvone amide was carried out as a foaming agent, and the constituent for surface layers was prepared.

[0168] And the fire-resistant vinyl-chloride-resin board (5mm in the whole thickness) of three layer structures which have a surface layer with a thickness of 0.5mm to both sides of a substratum with a thickness of 4mm was obtained by producing calendered sheeting of these constituents for substrata, and the constituent for surface layers, respectively, making it pile up mutually, and pressing.

[0169] While performing the fire-resistant test like examples 1-5 about this resin board, the mechanical strength and chemical resistance were investigated. The result is shown in Table 1.

[0170] While carrying out 0.5 weight section combination of the lauric-acid zinc as a decomposition accelerator and preparing the constituent for substrata to the basic combination constituent (U-PVC use) 110 weight section prepared in the [example 7] examples 1-4 To the basic combination constituent 110 weight section prepared in the examples 1-4, the AZOJI carvone amide was carried out as a foaming agent, 0.2 weight section combination of the lauric-acid zinc was carried out as the 0.3 weight section and a decomposition accelerator, and the constituent for surface layers was prepared.

[0171] And the fire-resistant vinyl-chloride-resin board (5mm in the whole thickness) of three layer structures which have a surface layer with a thickness of 0.5mm to both sides of a substratum with a thickness of 4mm was obtained by producing calendered sheeting of these constituents for substrata, and the constituent for surface layers, respectively, making it pile up mutually, and pressing.

[0172] While performing the fire-resistant test like examples 1-5 about this resin board, the mechanical strength and chemical resistance were investigated. The result is shown in Table 1.

[0173]

[Table 1]

		実施例 1	実施例 2	実施例 3	実施例 4	実施例 5	実施例 6		実施例 7	
							表面層	基層	表面層	基層
組成 (重量部)	基本配合組成物 (U-PVC使用)	110	110	110	110	—	110	110	110	110
	基本配合組成物 (C-PVC使用)		—	—	—	110	—	—	—	—
	発泡剤 (アゾジカルボンアミド)	0.1	—	—	—	—	0.5	—	0.3	—
	架橋剤 (トリアジンチオール)	—	0.7	—	—	—	—	—	—	—
	ラジカル発生剤 (シアミルパーオキシド)	—	—	0.7	—	—	—	0.5	—	—
	分解促進剤 (ラウリン酸亜鉛)	0.5	—	—	0.7	0.5	—	—	0.2	0.5
強度	アイソット衝撃強さ (KJ/m ²)	6.0	6.0	6.0	6.0	5.4	6.0		6.0	
	引張り強度 (N/mm ²)	50	50	50	50	50	50		50	
	伸び率(%)	160	150	150	150	100	140		160	
難燃性 テスト	着火の有無	無	無	無	無	無	無		無	
	着火時間(秒)	—	—	—	—	—	—		—	
耐薬品性	97% 硫酸	◎	○	○	○	◎	◎		◎	
	35% 硫酸	◎	○	○	○	◎	◎		◎	
	28% アンモニア水	◎	◎	◎	◎	◎	◎		◎	

[0174] If this table 1 is seen, it turns out that no fire-resistant vinyl-chloride-resin boards of the examples 1-7 which made a kind contain at least of a fire-resistant grant component are lit, but it has good fire retardancy. And an impact strength, tensile strength, the elongation of the resin board of the examples 1, 2, 3, 4, 6, and 7 which used the vinyl chloride resin (U-PVC) whose degree of chlorination is 56% of abbreviation, etc. are enough. On the other hand, although the resin board of the example 5 which used the back chlorinated polyvinyl chloride resin (C-PVC) whose degree of chlorination is 64% of abbreviation is a little inferior in an impact strength, tensile strength, elongation, etc. compared with the resin board of other examples In spite of being still in sufficient level and using the back chlorinated polyvinyl chloride resin of the weak degree of high chlorination chemical-resistant, the chemical resistance which was excellent by carrying out little content of the lauric-acid zinc as a decomposition accelerator with the 0.5 weight section is provided. Moreover, the 0.5 weight section and the few resin board of three layer structures of examples 6 and 7 also have [the content of a fire-resistant grant component] the outstanding chemical resistance.

[0175] As opposed to the basic combination constituent (U-PVC use) 110 weight section prepared in the [examples 8-12] examples 1-4 as a titanium compound The titanium oxide by which the front face was covered with examples 8-11 with the alumina (0.2 micrometers or less of abbreviation [Mean particle diameter :]), In the example 12, a fibrous potassium titanate as a foaming agent again an AZOJI carvone amide JIAMI looper oxide was alternatively mixed for the triazine thiol as a radical generating agent as a cross linking agent at a rate which shows lauric-acid zinc in the following table 2 as a decomposition accelerator, respectively, and five kinds of resin constituents were prepared. And after producing calendered sheeting with these resin constituents, the fire-resistant vinyl-chloride-resin board (5mm in thickness) of the monolayer structure which is five kinds from which composition differs was obtained by pressing.

[0176] While performing the fire-resistant test like examples 1-4 about these resin boards, the mechanical strength and chemical resistance were investigated. The result is shown in the following table 2.

[0177] To the basic combination constituent (U-PVC use) 110 weight section prepared in the [example 13] examples 1-4, 30 weight sections combination of the titanium oxide was carried out as a titanium compound, and the constituent for substrata was prepared. Moreover, to the basic combination constituent (U-PVC use) 110 weight section prepared in the examples 1-4,

titanium oxide was carried out as a titanium compound, 0.5 weight section combination of the AZOJI carvone amide was carried out as 5 weight sections and a foaming agent, and the constituent for surface layers was prepared.

[0178] And the fire-resistant vinyl-chloride-resin board (5mm in the whole thickness) of three layer structures which have a surface layer with a thickness of 0.5mm to both sides of a substratum with a thickness of 4mm was obtained by producing calendered sheeting of these constituents for substrata, and the constituent for surface layers, respectively, making it pile up mutually, and pressing.

[0179] While performing the fire-resistant test like examples 1-4 about this resin board, the mechanical strength and chemical resistance were investigated. The result is shown in the following table 2.

[0180] To the basic combination constituent (U-PVC use) 110 weight section prepared in the [example 14] examples 1-4, titanium oxide was carried out as a titanium compound, 0.5 weight section combination of the lauric-acid zinc was carried out as 30 weight sections and a decomposition accelerator, and the constituent for substrata was prepared. Moreover, to the basic combination constituent (U-PVC use) 110 weight section prepared in the examples 1-4, titanium oxide was carried out as a titanium compound, 0.5 weight section combination of the AZOJI carvone amide was carried out as 5 weight sections and a foaming agent, and the constituent for surface layers was prepared.

[0181] And the fire-resistant vinyl-chloride-resin board (5mm in the whole thickness) of three layer structures which have a surface layer with a thickness of 0.5mm to both sides of a substratum with a thickness of 4mm was obtained by producing calendered sheeting of these constituents for substrata, and the constituent for surface layers, respectively, making it pile up mutually, and pressing.

[0182] While performing the fire-resistant test like examples 1-4 about this resin board, the mechanical strength and chemical resistance were investigated. The result is shown in the following table 2.

[0183] The resin constituent which carried out 4 weight sections mixture of the titanium oxide as a titanium compound to the basic combination constituent (U-PVC use) 110 weight section prepared in the [examples 1-2 of comparison] examples 1-4 (example 1 of comparison), After preparing the resin constituent (example 2 of comparison) which carried out 55 weight sections mixture of the titanium oxide and producing calendered sheeting like examples 8-12, the fire-resistant vinyl-chloride-resin board (5mm in thickness) of two kinds of monolayer structures for comparison was obtained by pressing.

[0184] And while performing the fire-resistant test like examples 1-4 about these resin boards, the mechanical strength and chemical resistance were investigated. The result is shown in the following table 2.

[0185]

[Table 2]

例9	実施例10	実施例11	実施例12	実施例13		実施例14		比較例1	比較例2
				表面層	基層	表面層	基層		
0	110	110	110	110	110	110	110	110	110
5	25	25	18	5	30	5	30	4	55
-	-	-	-	0.5	-	0.5	-	-	-
5	-	-	-	-	-	-	-	-	-
-	0.5	-	-	-	-	-	-	-	-
-	-	0.5	0.5	-	-	-	0.5	0.5	0.5
5	6.5	6.5	7.0	6.5		6.5		6.0	3.0
8	48	48	55	50		50		56	58
30	100	100	130	110		110		180	10
無	無	無	無	無		無		有	無
-	-	-	-	-		-		90	-
△	△	△	△	◎		◎		◎	×
○	○	○	○	◎		◎		◎	×
◎	◎	◎	◎	◎		◎		◎	△

化合物はチタン酸カリウムである。

[0195] And the transparent fire-resistant vinyl-chloride-resin board (5mm in the whole thickness) of three layer structures

which have a surface layer with a thickness of 0.5mm to both sides of a substratum with a thickness of 4mm was obtained by producing calendered sheeting of these constituents for substrata, and the constituent for surface layers, respectively, making it pile up mutually, and pressing.

[0196] About this transparent resin board, all light transmissions, diffused-light line permeability, parallel ray permeability, and the Hayes value were measured like examples 15-18, and the fire-resistant test was performed further. The result is shown in the following table 3.

[0197]

[Table 3]

	実施例 15	実施例 16	実施例 17	実施例 18	実施例 19	実施例 20	実施例 21	実施例 22	実施例 23	
									表面層	基層
組成 (重量部)	基本配合組成物 (C-PVC使用) (塩素化度 54%)	112	112	112	—	—	—	—	112	—
	基本配合組成物 (U-PVC使用) (塩素化度 56%)	—	—	—	112	112	112	112	—	112
	分層促進剤 (ステアリン酸亜鉛)	0.5	—	—	0.7	—	—	0.5	0.3	0.7
	発泡剤 (ヒドランジ化合物)	—	—	—	—	—	—	0.1	0.1	—
	架橋剤 (トリアジンチオール)	—	0.5	—	—	0.7	—	—	—	—
	ラジカル発生剤 (ジアルキルパーオキシド)	—	—	0.5	—	—	0.7	—	—	—
難燃性テスト	着火の有無	無	無	無	無	無	無	無	無	無
	着火時間 (秒)	—	—	—	—	—	—	—	—	—
透 明 性	全光線透過率 (%)	76.8	76.9	75.6	72.4	84.0	83.5	80.1	82.2	82.2
	拡散光線透過率 (%)	7.3	7.4	7.2	15.3	5.4	5.3	8.8	6.8	6.8
	平行光線透過率 (%)	69.5	69.5	68.4	57.1	78.6	78.2	71.3	75.4	75.4
	ヘイズ値 (%)	9.5	9.6	9.5	21.1	6.4	6.3	11.0	8.3	8.3

[0198] When this table 3 is seen, it turns out that no transparent resin boards of examples 15-23 are lit, but good fire retardancy is demonstrated by work of the fire-resistant grant component contained to each resin board. And as for the resin board of the monolayer structure of the examples 19-22 which used the usual vinyl chloride resin (U-PVC) whose degree of chlorination is 56% of abbreviation, and the resin board of three layer structures of the example 23 which used this usual vinyl

chloride resin (U-PVC) for the substratum, it turns out that the Hayes value is 11% or less, and all light transmissions excel value] in transparency 80% or more. On the other hand, originally, although the transparent resin board of the examples 15-18 which used the post-chlorination vinyl chloride (C-PVC) whose transparency is the degree of high chlorination which is not not much good is a little inferior in transparency compared with the resin board of the examples 19-23 which used usual vinyl chloride resin (U-PVC), still, all light transmissions are 72% or more, a haze value is less than 22%, and it turns out that it has good transparency.

[0199] To the back chlorinated-polyvinyl-chloride-resin (C-PVC) 100 weight section whose degree of [example 24] chlorination is 64% of abbreviation, as a Lynn system flame retarder, the 5.0 weight sections were carried out for tricresyl phosphate, 4.0 weight sections combination of the thermostabilizer of the 7.0 weight sections and a dibutyltin maleate system was carried out for the chlorinated polyethylene, and the resin constituent was prepared. And the transparent fire-resistant vinyl-chloride-resin board with a thickness of 5mm was manufactured by producing calendered sheeting with a thickness of 0.5mm using this resin constituent, and pressing ten sheets of this calendered sheeting in piles.

[0200] About this transparent resin board, all light transmissions, diffused-light line permeability, parallel ray permeability, and the Hayes value were measured like examples 15-18, and the fire-resistant test was performed further. The result is shown in the following table 4.

[0201] the resin constituent prepared in the [example 25] example 24 -- as a decomposition accelerator -- a zinc stearate -- further -- 0.2 weight section combination was carried out and the transparent fire-resistant vinyl-chloride-resin board with a thickness of 5mm was manufactured like the example 24 using this

[0202] And all light transmissions, diffused-light line permeability, parallel ray permeability, and the Hayes value were measured like [board / resin / transparent / this] examples 15-18, and the fire-resistant test was performed further. The result is shown in the following table 4.

[0203] the resin constituent prepared in the [example 26] example 24 -- as a foaming agent -- a hydrazide compound -- further -- 0.3 weight section combination was carried out and the transparent fire-resistant vinyl-chloride-resin board with a thickness of 5mm was manufactured like the example 24 using this

[0204] And all light transmissions, diffused-light line permeability, parallel ray permeability, and the Hayes value were measured like [board / resin / transparent / this] examples 15-18, and the fire-resistant test was performed further. The result is shown in the following table 4.

[0205] While piling up six calendered sheeting produced using the resin constituent prepared in the [example 27] example 25, the transparent fire-resistant vinyl-chloride-resin board (5mm in the whole thickness) of three layer structures which carried out the laminating unification of the surface layer with a thickness of 1mm was manufactured to vertical both sides of a core layer with a thickness of 3mm by pressing at a time in piles two calendered sheeting produced with the resin constituent of an example 26 in the vertical both sides.

[0206] About this transparent resin board, all light transmissions, diffused-light line permeability, parallel ray permeability, and the Hayes value were measured like examples 15-18, and the fire-resistant test was performed further. The result is shown in the following table 4.

[0207] It considered as the zinc compound to the general vinyl-chloride-resin (U-PVC) 100 weight section whose degree of [example 28] chlorination is 56.4%, and stearin acid was carried out as the 4.0 weight sections and lubricant, 1.0 weight section combination of the DOP was carried out [the zinc stearate] for the stabilizer of the 0.2 weight section (when it converts into the amount of metal zinc, it is the 0.02 weight section), and a dibutyltin maleate system as the 0.5 weight section and a plasticizer, and the resin constituent was prepared.

[0208] And the transparent fire-resistant vinyl-chloride-resin board of monolayer structure with a thickness of 5mm was manufactured by producing calendered sheeting with a thickness of 0.5mm and pressing ten sheets of this calendered sheeting in piles using this resin constituent.

[0209] About this transparent resin board, all light transmissions, diffused-light line permeability, parallel ray permeability, and the Hayes value were measured like examples 15-18, and the fire-resistant test was performed further. The result is shown in the following table 4.

[0210] To the back chlorinated-polyvinyl-chloride-resin (C-PVC) 100 weight section whose degree of [example 29] chlorination is 64% of abbreviation, the thermostabilizer of the 7.0 weight sections and a dibutyltin maleate system was carried out for tricresyl phosphate as a Lynn system flame retarder, 0.3 weight section combination of the hydrazide compound was carried out as the 4.0 weight sections and a foaming agent, and the resin constituent was prepared. And the transparent fire-resistant vinyl-chloride-resin board with a thickness of 5mm was manufactured by producing calendered sheeting with a thickness of 0.5mm using this resin constituent, and pressing ten sheets of this calendered sheeting in piles.

[0211] About this transparent resin board, all light transmissions, diffused-light line permeability, parallel ray permeability, and the Hayes value were measured like examples 15-18, and the fire-resistant test was performed further. The result is shown in the following table 4.

[0212] To the back chlorinated-polyvinyl-chloride-resin (C-PVC) 100 weight section whose degree of [example 3 of comparison] chlorination is 64% of abbreviation, stearin acid was carried out for the stabilizer of a dibutyltin maleate system, 5.5 weight sections combination of the 1.5 weight section and the MBS system reinforcing agent was carried out for the 0.5 weight section and acrylic processing aid as the 4.0 weight sections and lubricant, and the resin constituent was prepared.

[0213] And while manufacturing the transparent vinyl-chloride-resin board with a thickness of 5mm like the example 24 using this constituent and measuring all the light transmissions, diffused-light line permeability, parallel ray permeability, and the

Hayes value, the fire-resistant test was performed. The result is shown in the following table 4.

[0214] Except having omitted the [example 4 of comparison] zinc stearate, the resin constituent was prepared like the example 28 and the transparent vinyl-chloride-resin board with a thickness of 5mm was manufactured.

[0215] And all light transmissions, diffused-light line permeability, parallel ray permeability, and the Hayes value were measured like [board / resin / this] examples 15-18, and the fire-resistant test was performed further. The result is shown in the following table 4.

[0216]

[Table 4]

	実施例 24	実施例 25	実施例 26	実施例 27		実施例 28	実施例 29	比較例 3	比較例 4
				表面層	基層				
組 成 (重 量 部)	C-PVC (塩素化度 64%)	100	100	100	100	—	100	100	—
	一般PVC (塩素化度 56%)	—	—	—	—	100	—	—	100
	ジブチル錫マレート系安定剤	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	ステアリン酸	—	—	—	—	0.5	—	0.5	0.5
	DOP	—	—	—	—	1.0	—	—	1.0
	アクリル系加工助剤	—	—	—	—	—	—	1.5	—
	MBS系補強剤	—	—	—	—	—	—	5.5	—
	塩素化ポリエチレン	7.0	7.0	7.0	7.0	—	—	—	—
	リン系難燃剤 (トリクレジル ホスフェート)	5.0	5.0	5.0	5.0	—	7.0	—	—
	分解促進剤 (ステアリン酸亜鉛)	—	0.2	—	—	0.2	—	—	—
難燃性テスト	発泡剤 (ヒドラジド化合物)	—	—	0.3	0.3	—	0.3	—	—
	着火の有無	無	無	無	無	無	無	有	有
	着火時間 (秒)	—	—	—	—	—	—	20	16
透 明 性	全光線透過率 (%)	84.9	82.0	70.1	78.0	85.1	75.2	77.6	86.4
	拡散光線透過率 (%)	5.0	7.6	38.2	18.0	4.8	36.3	7.4	1.6
	平行光線透過率 (%)	79.9	74.4	31.9	60.0	80.3	38.9	70.2	84.8
	ヘイズ値 (%)	5.9	9.3	54.5	23.1	5.6	48.3	9.5	1.9

[0217] If the examples 24-27 and the example 3 of comparison of Table 4 are contrasted, the resin board of examples 24-27 A chlorinated polyethylene, The fire retardancy which was excellent with work of the Lynn system flame retarder, a

decomposition accelerator, a foaming agent, etc. is demonstrated. The resin board of the example 3 of comparison which does not contain the above-mentioned chlorinated polyethylene, the Lynn system flame retarder, a decomposition accelerator, a foaming agent, etc. to the result that had set in the fire-resistant test and a gap did not light, either having been obtained In spite of using back chlorinated polyvinyl chloride resin (C-PVC) with the same high degree of chlorination as examples 24-27, it is inferior to fire retardancy, and the result of lighting in 20 seconds was obtained. Thereby, it was proved that a chlorinated polyethylene, the Lynn system flame retarder, a decomposition accelerator, a foaming agent, etc. were effective in fire-resistant grant.

[0218] Moreover, the resin board of the example 29 which blended the foaming agent which is a flame retarder has the fire retardancy excellent only in having omitted the chlorinated polyethylene and having blended the Lynn system flame retarder, and ignition was not seen. Thereby, when the flame retarder is blended, it turns out that either a chlorinated polyethylene or the Lynn system flame retarder is omissible.

[0219] Moreover, in spite of using general vinyl chloride resin (U-PVC) with fire retardancy lower than back chlorinated polyvinyl chloride resin for the resin board of an example 28 As opposed to the result of fire retardancy improving since a zinc stearate is included as a zinc compound, and not lighting in a fire-resistant test having been obtained It was the result of saying that the resin board which consists of general vinyl chloride resin which does not contain a zinc stearate like the resin board of the example 4 of comparison is inferior to fire retardancy, and is further lit rather than the resin board of the example 3 of comparison for a short time.

[0220] Moreover, since the Hayes value rises, when using a foaming agent, it turns out that it is more desirable to make a surface layer contain a foaming agent like an example 27, and for that in which, as for each resin board of examples 24-29, 70% or more and the Hayes value contain a foaming agent like the resin board of examples 26 and 29 although all light transmissions are 60% or less and have transparency to suppress the rise of the Hayes value.

[0221]

[Effect of the Invention] The effect that the thing of fire retardancy of a double layer structure also improves notably also as for the thing of monolayer structure, and, as for the fire-resistant vinyl chloride system resin Plastic solid of this invention, the amount of emitting smoke and the amount of generation of gas also decrease is done so, and a transparent Plastic solid has good transparency. And the Plastic solid of this invention has sufficient practical strength, and almost has neither chemical resistance nor a corrosion-resistant fall, and especially the thing of a double layer structure has good chemical resistance and corrosion resistance on the front face of a Plastic solid, and does so various kinds of uses as which chemical resistance and fire retardancy are required, and the effect that it can be suitably used as industrial use material, such as semiconductor fabrication machines and equipment, especially.

[Translation done.]